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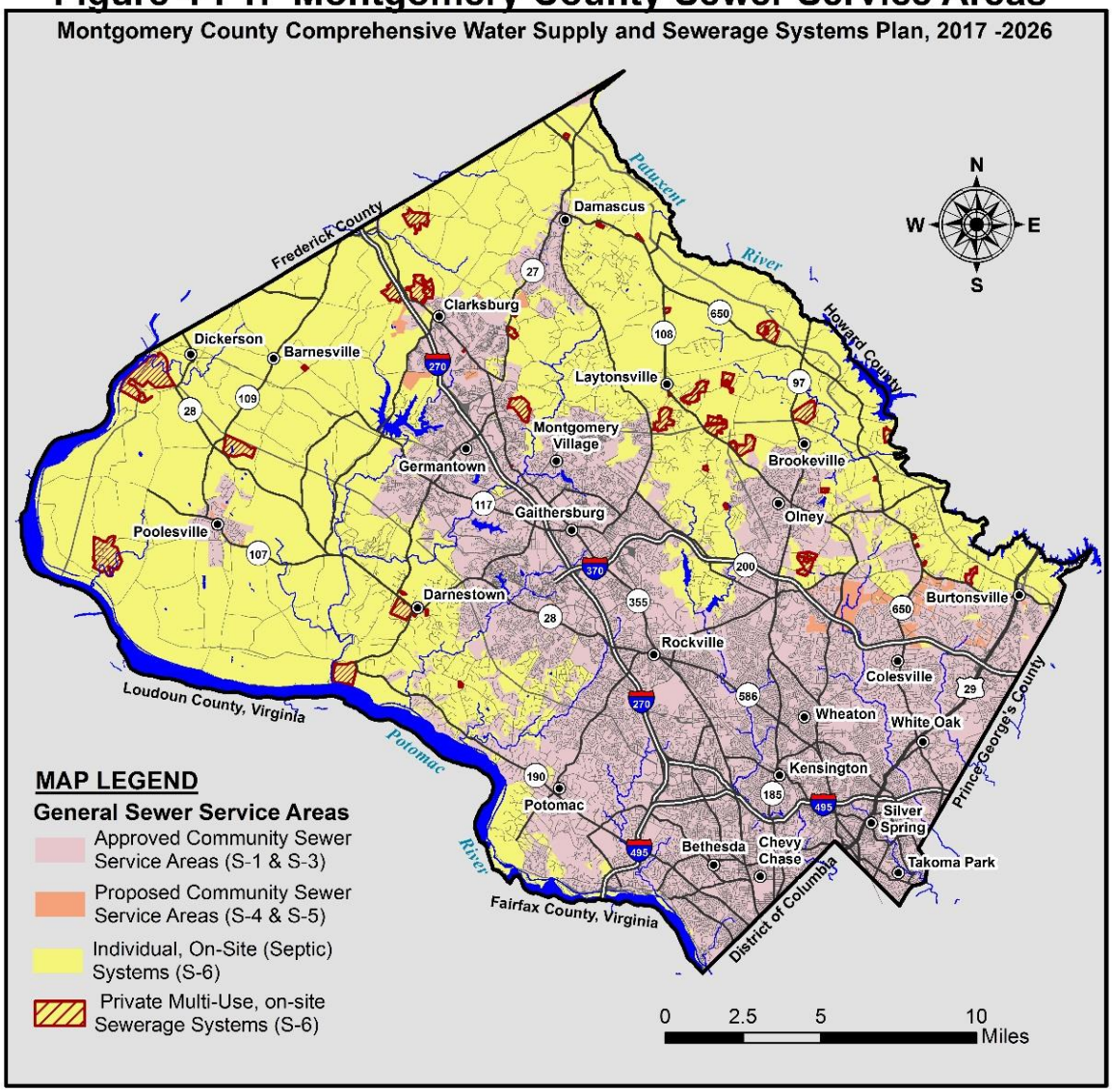
INTRODUCTION AND BACKGROUND:

This Chapter describes the County's existing and planned community and private, individual sewerage systems. It incorporates components and related discussions of major programs, policies, and issues concerning sewerage systems serving the residents and businesses in Montgomery County. It also projects sewerage collection/conveyance and treatment system needs.

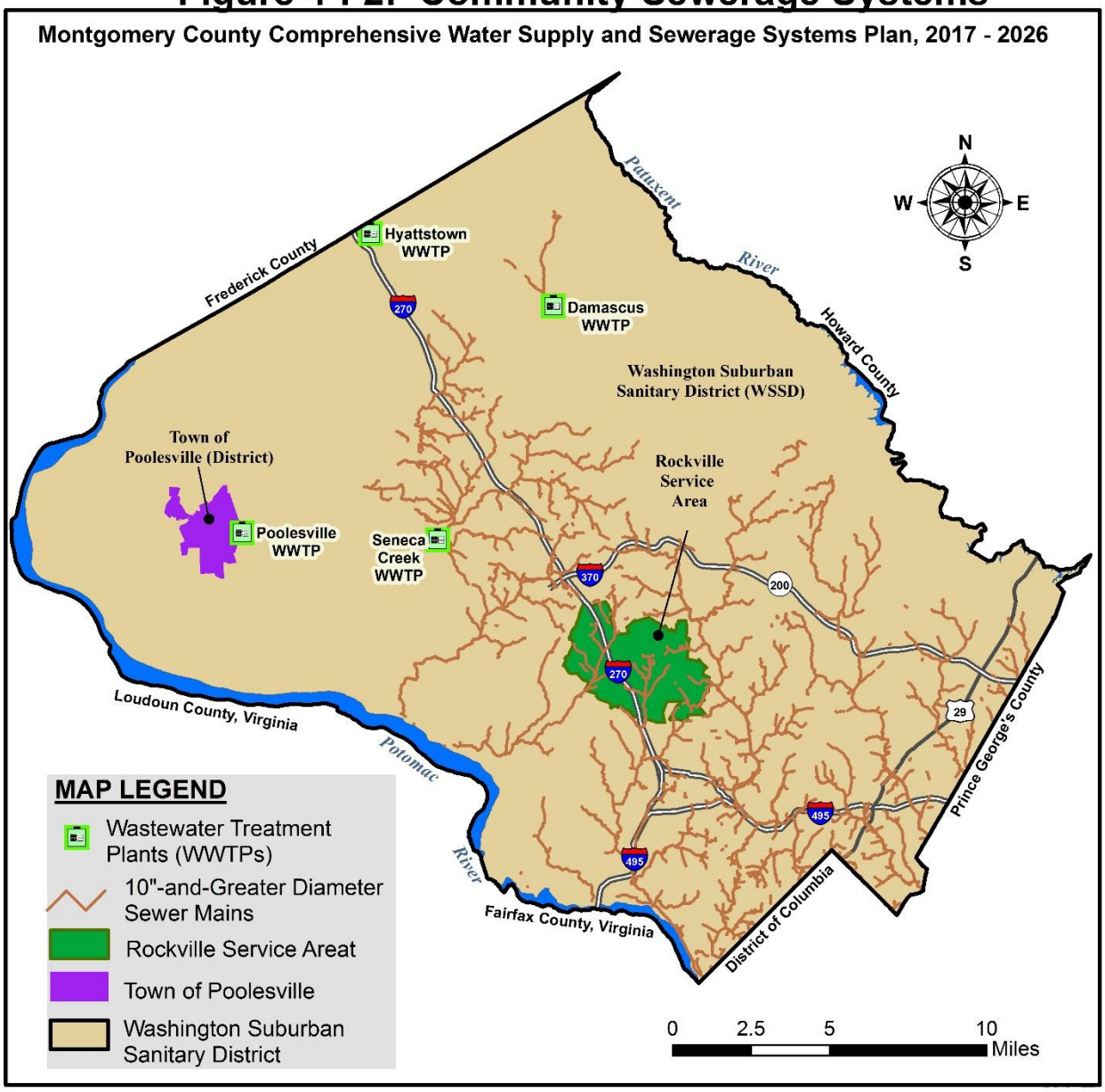
As discussed in Chapter 1, this Plan classifies all areas of the County into one of five category designations for sewer service areas. The categories range from areas served by community systems (S-1) to areas where improvements to or construction of new community systems will be planned in the future (S-3, S-4, and S-5) to areas where there is no planned community service (S-6). (In practice, Montgomery County does not use category S-2, which designates areas where community sewerage system projects are in the final planning stages.) Figure 4-F1 shows a generalized distribution of sewer service area categories throughout the County. For additional detailed information on sewer service area categories, please refer to Chapter 1.

Figure 4-F1: Montgomery County Sewer Service Areas



A sewer service area can be defined by a sewage system operating authority, and/or by a geographic or structural separation of a group of related treatment and transmission facilities. The County is divided into three publicly-operated and largely separate sanitary service areas or districts: The Washington Suburban Sanitary District (WSSD), the largest system, serving most of the County; and two smaller municipal districts operated by the City of Rockville and the Town of Poolesville. (See Figure 4-F2.)

Figure 4-F2: Community Sewerage Systems

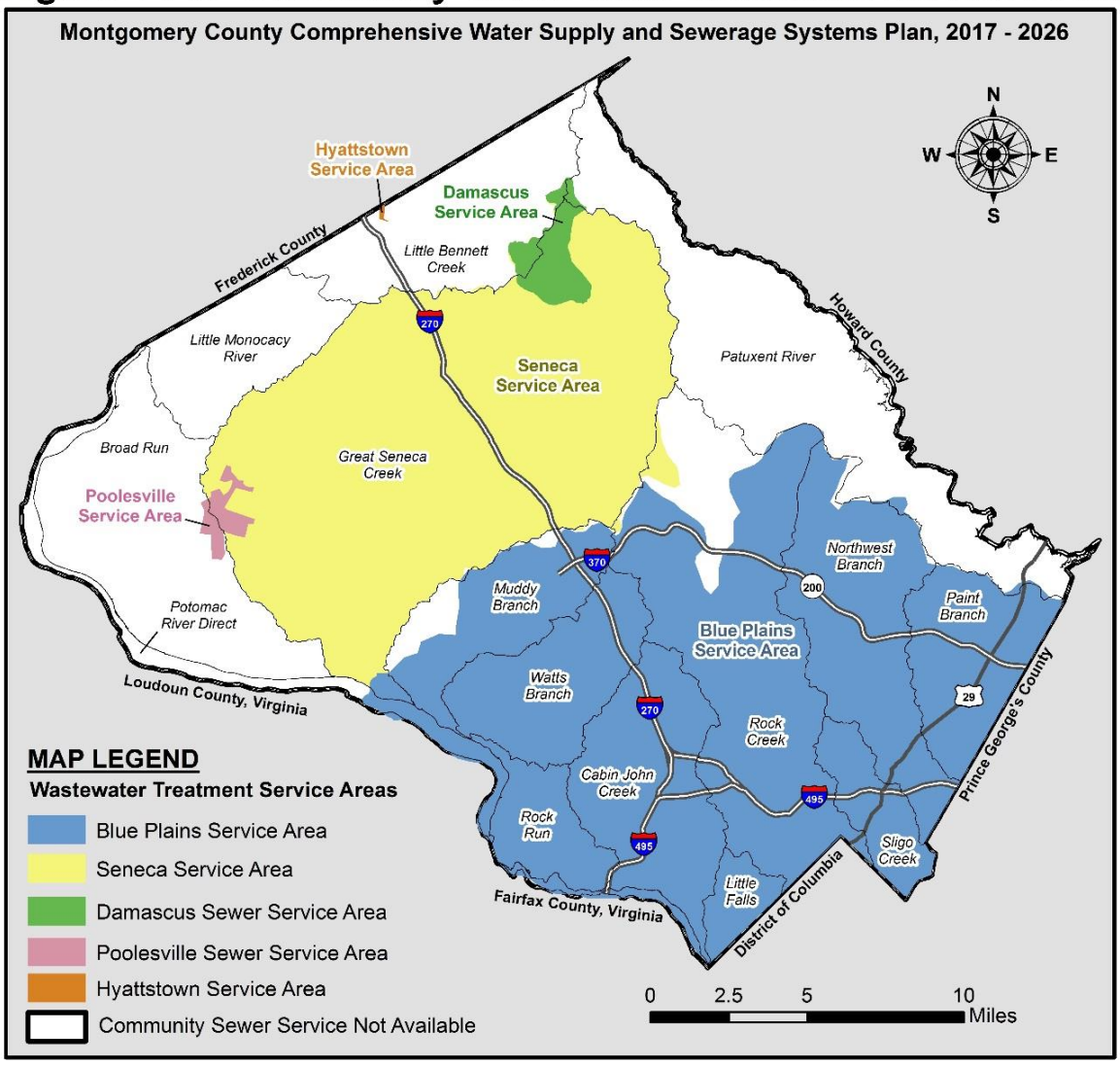


Each service area is served by its own sewage collection and transmission systems. Sewage from the WSSD is treated at several local plants operated by WSSC and at one regional facility, the Blue Plains Wastewater Treatment Plant (WWTP), located in the District of Columbia. Flows from Rockville Service Area eventually enter the WSSD system for transmission to and treatment at the Blue Plains WWTP. The Town of Poolesville's treatment plant, for the most part, serves only the town itself. Information for the City of Rockville Service Area and the Town of Poolesville has been provided primarily by those municipalities and is incorporated into this Plan consistent with State law.

Some properties within each service area are served by individual, on-site systems, rather than community systems. The vast majority of these individual systems are within the WSSD. Information on individual, on-site systems follows at the end of the chapter.

Based on function, there are two components to a wastewater disposal system: collection/conveyance facilities and treatment facilities. A wastewater treatment service area is a geographic region comprised of a section of one or several sewer basins, where both collection/conveyance and treatment are provided. Presently five community wastewater treatment service areas provide service within Montgomery County: Blue Plains, Seneca, Damascus, Hyattstown, and Poolesville. Except for the Town of Poolesville which is largely independent from WSSD, the rest of community wastewater service areas are within the WSSD. It should also be noted that the Rockville Service Area (RSA) is located within the Blue Plains service area. Figure 4-F3 shows the areas served by each of these five wastewater treatment plants. (*Note: Not shown in the map is a golf course receiving community sewer service through the Mill Bottom WWTP located in Frederick County near Interstate 70. The golf course operated by the Montgomery County Revenue Authority and is located at the northernmost tip of the County, directly north of Damascus. No other properties in Montgomery County in the vicinity of the golf course are eligible to receive community sewer service.*)

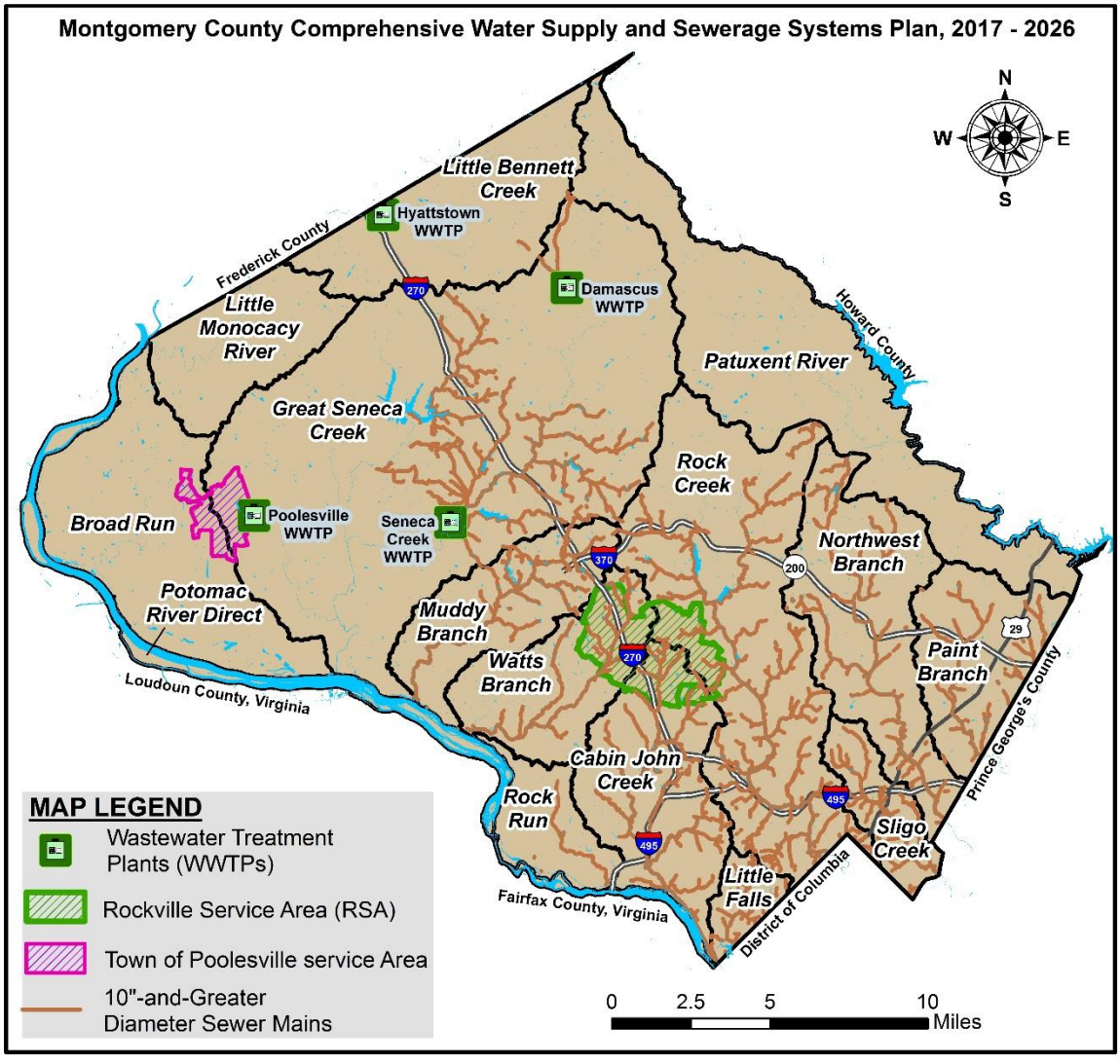
Figure 4-F3: Community Wastewater Treatment Service Areas



The County is bounded by two rivers: The Potomac to the southwest and the Patuxent to the northeast. Most of the County's streams flow into the Potomac River, either through local tributaries, such as Watts Branch, Rock Creek, Cabin John Creek, and Great Seneca Creek, or through watersheds that drain to two major tributaries outside the County: The Anacostia and Monocacy Rivers. The southeastern part of the County, south of Olney and east of Georgia Avenue, drains toward the Anacostia River, and includes the Sligo Creek, Northwest Branch, Paint Branch, and Little Paint Branch watersheds. Portions of the northwest part of the County drains toward the Monocacy River, and include the Little Monocacy River, Bennett Creek, and Little Bennett Creek watersheds. The northeastern part of the County, along the border with Howard County, drains toward the Patuxent River.

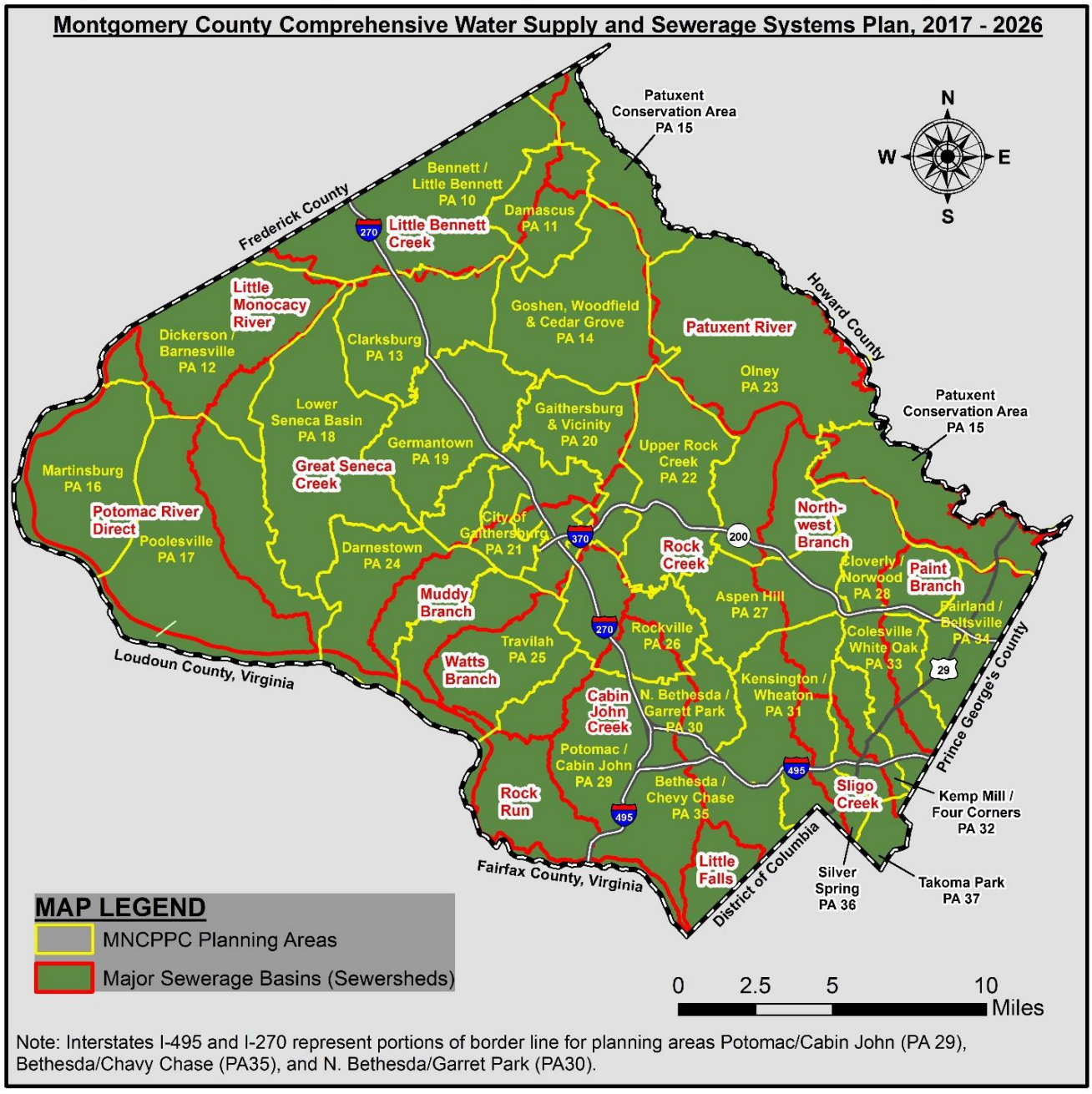
To take advantage of gravity to the greatest extent possible, sewage collection and conveyance systems generally follow streams and waterways within various drainage basins. Because of this, the sewer basins (or sewersheds) in this chapter are often referred to by the name of their related watershed (*e.g.*, Watts Branch, Seneca Creek, etc.). Through major trunk lines and pumping facilities the sewage flows from individual sewersheds are collected and conveyed for their eventual treatment at a wastewater treatment plant. The major drainage basins in the County are shown in Figure 4-F4.

Figure 4-F4: Major Sewerage Basins (Sewersheds)



The County is also divided into 27 land use planning areas, each area forming a fairly cohesive district bounded by a major highway or natural border such as a stream valley. These planning areas have been established by legislative action of the County Council. An overlay of the drainage basins and planning areas is shown in Figure 4-F5.

Figure 4-F5: Major Sewerage Basins and Planning Areas



All of the County's community sewerage systems, wastewater treatment service areas, sewersheds, and planning areas contained in each community sewerage systems, are listed in Table 4-T1.

Table 4-T1: Montgomery County Sewer Service Areas

Community Sewerage Systems	Treatment Plant Service Area	Sewer Basins	Planning Areas
WASHINGTON SUBURBAN SANITARY DISTRICT	**BLUE PLAINS**	Muddy Branch Rock Creek Watts Branch Cabin John Creek Rock Run Little Falls Branch Sligo Creek Paint Branch Northwest Branch *Note: See Figure 4-F5 for detailed information on the relationships between sewer basins and planning areas in the Blue Plains and other treatment plant service areas.*	Aspen Hill..... (PA 27) Bethesda-Chevy Chase ..... (PA 35) Cloverly - Norwood..... (PA 28) Colesville - White Oak..... (PA 33) Fairland - Beltsville..... (PA 34) Gaithersburg Vicinity..... (PA 20) Gaithersburg & Washington Grove.. (PA 21) Germantown ..... (PA 19) Kemp Hill Four Corners..... (PA 32) Kensington - Wheaton..... (PA 31) North Bethesda - Garrett Park..... (PA 30) Olney ..... (PA 23) Patuxent Watershed Conservation.. (PA 15) Potomac -Cabin John..... (PA 29) Rockville ..... (PA 26) Silver Spring ..... (PA 36) Takoma Park..... (PA 37) Travilah..... (PA 25) Upper Rock Creek Watershed..... (PA 22)
	SENECA	Seneca Creek	Darnestown..... (PA 24) Clarksburg ..... (PA 13) Gaithersburg Vicinity..... (PA 20) Gaithersburg & Washington Grove.. (PA 21) Germantown ..... (PA 19)
	DAMASCUS	Portions of Seneca Creek, Patuxent, and Monocacy River	Damascus..... (PA 11)
	HYATTSTOWN	Monocacy River	Bennett & Little Bennett ..... (PA 10)
	POOLESVILLE*	Portions of Seneca Creek	Poolesville..... (PA 17)
ROCKVILLE SERVICE AREA	**BLUE PLAINS**	Portions of Cabin John, Watts and Rock Creek	Rockville ..... (PA 26)
TOWN OF POOLESVILLE	**POOLESVILLE**	Portions of both Seneca Creek and Potomac River	Poolesville..... (PA 17)

* The Poolesville WWTP serves the communities of Jonesville and Jerusalem in the WSSD.

THE WASHINGTON SUBURBAN SANITARY DISTRICT:

The Washington Suburban Sanitary District (WSSD), established by State law, includes most of Montgomery and Prince George's Counties, encompassing a total area of approximately 1000 square miles. Within Montgomery County, areas excluded from the WSSD include most of the City of Rockville and the Town of Poolesville. Sewer service areas managed by the Washington Suburban Sanitary Commission (WSSC) within Montgomery County include the areas served by the Blue Plains, Seneca, Damascus, and Hyattstown collection and treatment systems. WSSC also manages a small portion of the WSSD that is served by the Poolesville WWTP (Jonesville and Jerusalem areas). The City of Rockville, also part of the Blue Plains service area, manages its own collection and conveyance systems, but relies on Blue Plains for treatment of the wastewater generated in this area. The Town of Poolesville manages its own sewerage system, including collection, conveyance and treatment systems within the Town's boundaries.

Guided by policies specified in this Plan, the provision of community sewer service within Montgomery County generally follows the patterns established by the County's General Plan for development, "On Wedges and Corridors." Community service is established and planned for the central and southern part of the County, following three major transportation corridors of higher density development in these areas:

- The U.S. Route 29 (Columbia Pike) corridor to Burtonsville,

- The Georgia Avenue (State Route 97) corridor to Olney. And
- The U.S. Interstate 270/State Route 27 (Ridge Road) corridor to Clarksburg and Damascus.

Elsewhere, primarily in the western and northeastern areas of the County, wastewater disposal service generally depends on individual, on-site systems, which discharge their effluent for treatment in private on-site septic systems.

I.A. Government Responsibilities:

The responsibilities for water supply planning within the WSSD are multi-jurisdictional and benefit from the cooperative efforts of municipal, County, State, Federal, and regional authorities. This is also true with regard to the Blue Plains WWTP, a wastewater treatment facility jointly used by several area jurisdictions. The agencies assisting in these planning efforts include the following:

- Montgomery County Government
  - Department of Environmental Protection (DEP)
  - Department of Permitting Services (DPS)
- Washington Suburban Sanitary Commission (WSSC)
- Maryland - National Capital Park and Planning Commission (M-NCPPC)
  - Montgomery County Planning Department
- District of Columbia Water and Sewer Authority (DC WATER)
- Metropolitan Washington Council of Governments (COG)
- State of Maryland
  - Department of the Environment (MDE)
  - Department of Planning (MDP)

These agencies, and their primary responsibilities and programs, are described in more details in Chapter 1, Section I.D.

I.B. Programs and Policies:

The following pages provide an overview of the major policies and programs relating to WSSC's role and functions in providing sewer services within Montgomery County's portion of the WSSD.

I.B.1. Facility Planning, Project Development and Project Approval Processes:

This information is consolidated in Chapter 1, Section III.A.5.

Interjurisdictional Agreements:

Montgomery County is benefitted by the shared use of several wastewater conveyance and treatment systems. The Washington Metropolitan Area has two major regional sewerage facilities that serve the region. These facilities include are the Potomac Interceptor (PI) sewer and the Blue Plains WWTP. The shared use of these facilities has been governed by a series of regional agreements dating to the 1950's. Other shared facilities are localized within Montgomery County. The following is a summary of major Intermunicipal agreements with shared facilities affecting the flow of wastewater and available treatment capacity for Montgomery County.

Blue Plains Intermunicipal Agreement (IMA) - The parties to the Blue Plains Intermunicipal Agreement (IMA) include the District of Columbia the District of Columbia Water and Sewerage Authority (D.C. Water), Montgomery and Prince George's counties, Maryland; WSSC, and Fairfax County, Virginia. This agreement is a regional contract defining the responsibilities of the signatories for managing the finances and operations for wastewater collection and treatment services and related biosolids management for the Blue Plains Service Area. The agreement was revised and updated in 2012 in order to provide an updated and relevant document for present and future issues. The Agreement called the "the 2012 IMA" provides for:

- Defines the rights, obligations and responsibilities of the signatories regarding the use and management of facilities for wastewater transmission and treatment and for biosolids management.
- Allocates average and peak flows to the major interceptor sewers leading to the Blue Plains WWTP.
- Allocates the Blue Plains WWTP treatment capacity.
- Arranges for sharing among the signatories' capital facility costs in proportion to capacity allocation and for sharing facility operating costs in proportion to actual flow.
- Defines the process of making future planning decisions.
- Provides a mechanism for continuing coordination, cooperation and communication among the signatories.
- Supports a continuing water quality monitoring and evaluation program.
- Incorporates all applicable regional agreements for the joint use of the Blue Plains WWTP.

WSSC - Rockville Agreements - The City of Rockville's sewage collection system conveys flows to six different interconnections with WSSC pipelines for ultimate delivery to the Blue Plains WWTP. The city's use of WSSC conveyance facilities has been defined through several transmission agreements. A 1956 agreement provides for the City to discharge a peak flow of 6.8 MGD into the Cabin John Basin; the City's negotiated capacity in the Cabin John basin downstream of Booze Creek increases to 8.0 MGD. A 1966 agreement provides for a maximum discharge of 8.0 MGD to the Watts Branch Basin. The City of Rockville is also permitted to discharge a peak flow of 9.84 MGD into the Rock Creek Basin. In 1975, the City of Rockville and WSSC executed a treatment capacity agreement which specified that WSSC would provide up to an additional 0.4 MGD per fiscal year of treatment capacity to Rockville from the WSSC's proportionate share of Blue Plains WWTP capacity, up to a total annual average City flow of 9.31 MGD. The City acknowledges that it has not purchased sufficient peak capacity in all sewers to convey an annual average of 9.31 MGD to the Blue Plains Wastewater Treatment Plant.

WSSC - Poolesville Agreements - A 1984 agreement between WSSC and the Town of Poolesville allows WSSC to discharge a maximum quarterly average daily flow of 20,000 GPD from the Jonesville and Jerusalem communities just north of the town in the WSSD into the Poolesville WWTP for treatment.

I.B.2. Wastewater Flow Analysis:

Flow projections are based on the County's adopted land use plans and approved service areas for future growth, and are in accordance with the County's latest master plans for development. The projected future flows are estimated in proportion to population projections with an allowance for planned commercial and industrial growth and factors such as infiltration (extraneous groundwater) and inflow (water discharged into sewer systems from roof leaders, area drains, etc.). WSSC is responsible for conducting wastewater flow measurements and flow analysis for all areas within the WSSD. Various aspects of WSSC's flow management system are discussed in the following sections.

Flow Monitoring: WSSC's program for field monitoring of sewage flows provides continuous data on the status of peak and average wastewater flows throughout the WSSC system. The current monitoring system consists of permanent stations which telemeter flow data to a central computer. Fifty permanent sewer flow monitors and seven permanent rain gauges have been installed throughout the various sewer basins in Montgomery County. In addition, WSSC uses temporary flow meters which it can install at various locations for special studies. The following table presents Permanent flow meter and gauge locations for all the sewer basins are shown in Table 4-T2.

Table 4-T2: WSSC Montgomery County Sewer Meters and Rain Gauges by Watershed

Sewer Basin	Flow Meters	Rain Gauges	Billing Meters
Cabin John	11	1	2
Little Falls	5	0	1
Muddy Branch	4	1	1
Northwest Branch	4	0	0
Paint Branch [1]	4	1	2
Rock Creek	23	3	3
Rock Run	1	0	0
Seneca Creek [2]	18	2	1
Sligo Creek 1	9	0	0
Watts Branch	4	1	2
Total	83	12	12

[1] Montgomery County only
[2] Includes Magruder Branch (Damascus) and Jonesville/Jerusalem (Poolesville)

The Planning Group within the Engineering and Construction team at WSSC is responsible for the maintenance and operation of the Consolidated Engineering System (CES), a computerized record keeping system which tracks the status of unconnected sewer commitments by geographic area (basin), type of future connection (residential, commercial, etc.), estimated average daily flow contribution, and expected connection date. WSSC uses data from the CES to calculate remaining available treatment capacity in a particular service area, and to assist in projecting future sewage flows at various points in the transmission system. The CES tracks future additional flow on the basis of authorizations granted by the WSSC, plumbing permits and actual hookups.

Flow Reporting and Tracking: WSSC generates the following reports on a regular basis:

- Semiannual Available Capacity Report – WSSC produces a bi-annual available capacity report for its wastewater treatment service areas. This report is distributed to state regulatory and County government agencies. The reports WSSC track plumbing permits, hookups, and outstanding authorizations in a wastewater treatment plant service area to determine whether existing wastewater flows and future committed flows approach wastewater treatment plant capacity.
- Capacity Management Plans –The Maryland Department of the Environment (MDE) has issued guidelines for the development of Water and Wastewater Capacity Management Plans for those jurisdictions that control the allocation of water and sewer. These management plans are useful planning tools to ensure that the municipalities have adequate water and sewer facilities to service proposed developments and to provide guidance in developing annual Municipal Sewage Capacity Reports when required. A Wastewater Capacity Management Plan must be submitted to MDE if the most recent three year average flow is over 80% of its design capacity or if it is anticipated to exceed 80% in the following year. As of the date of this Plan, there are no wastewater treatment facilities that are regulated by MDE that receive Montgomery County flow that require the submission of such Plans.
- Flow Projections for Montgomery County Sewer Service Areas – This report is issued on an as-needed basis. Forecasts are by major wastewater treatment areas, as determined by WSSC

staff. Predicted sanitary flow is based on current M-NCPPC growth forecasts and the latest unit flow factors projected for 5-, 10-, 15- , and 20 -year periods.

- Unit Flow Factor Report for the WSSC Service Area – This report is produced periodically and presents current unit flow factors to be used in the wastewater flow projections. It includes evaluation of the prior winter's water consumption for various user categories to detect any trends in projected sanitary flow. This report includes a reasonable allowance for unit infiltration/inflow based on rainfall and groundwater level probability analyses.

Wastewater System Modeling - Beginning in 2006, WSSC developed, calibrated, and evaluated 21 sewer basin dynamic hydraulic models in its Sanitary District under the Consent Decree's Article Five (V) requirements (Judge Messite, U.S. Civil Action No. PJM-04-3679, December 7, 2005). The calibrated models are used to estimate the impact of peak wastewater flows on collection system existing capacity, identify portions of the collection system where capacity is insufficient for present and/or future wastewater flow, plan sewer improvements, and make determinations regarding future development of the collection system.

The model included WSSC sewers of 10 inches in diameter and greater and also some 8-inch diameter lines required for model connectivity or where recurrent capacity-related overflows (at the time of the Consent Decree settlement) occurred. The models were built using WSSC asset information in its existing mainframe Sewer Model Database and populated in its Geographic Information System (GIS). Once, the model network was built by importing of the GIS data and verified, the models were calibrated for existing dry weather flows based on WSSC permanent flow metering data. The model network flows were calibrated to two historic wet weather events and then verified using a third independent verification event. Future flows using dry weather conditions were developed based on demographic projections of sewered household and employment increases and applied WSSC unit wastewater flow factors.

The models were then applied using the synthetic design storms (see bullets below) as set in the Consent Decree requirements and the modeling reports noted the observed results from the model simulations:

- Baseline dry-weather flows;
- 2-year (total storm volume of 3.11 inches over 24 hours) Soil Conservation Service Type II rainfall distribution;
- 10-year (total storm volume of 4.78 inches over 24 hours) Soil Conservation Service Type II rainfall distribution; and
- 10-year, 24-hour SCS Type II rainfall distribution with year 2020 growth in households and employment.

Beginning in 2009, WSSC reevaluated its 21 sewer basin hydraulic models for its capital sewers (15-inches and larger) and wastewater facilities using an actual event storm distribution, from a wet weather event experienced in the WSSC Service Area occurring on a May 8, 2008. This rainfall event caused significant flooding in the Sanitary District. This May 8, 2008, storm distribution is currently used for the 2-year and 10-year design "storms of record" for WSSC hydraulic modeling studies (these storms are referred to as the WSSC Design Storms).

From these modeling studies, WSSC plans to work with Montgomery County regarding the development and implementation of facility planning studies to address collection system capacity constraints. In addition, the modeling studies will supplement other Consent Decree projects conducted by other WSSC organizational teams, such as trunk sewer walks, basin Sewer System Evaluation Surveys (SSES), and the resulting rehabilitation projects identified to reduce or remove sources of excessive infiltration and inflow.

For future sewer system capacity planning, WSSC developed a new standard procedure using its dynamic sewer system hydraulic model and the WSSC design storms (Standard Procedure ENG 09-02, effective May 1, 2009) for reviews conducted as part of the Hydraulic Planning Analyses (HPA) conducted under WSSC Development Services Process. The procedure is used to determine the impact of significant proposed development (generating 100,000 gallons or greater base sanitary flow) on the downstream CIP-size (15 inches in diameter and above) sewer system and wastewater conveyance facilities under significant wet weather conditions. The procedure also establishes requirements for proposed development connecting into or upstream of CIP-size trunk sewers or wastewater pumping stations above projected overflows based on existing dry weather flow and the 2-year WSSC design storm. Effective January 2, 2012, standard procedure **ENG 11-01** amended ENG 09-02 by the addition of a waiver provision.

Under Article Seven (VII) of the Consent Decree, WSSC is required to conduct Performance Assessments of the work undertaken in Articles Two (Sewer System Evaluation Surveys or SSES) and Six (Sewer Repair, Replacement, and Rehabilitation Plans or SR^3 Plans) for each Sewer Basin in the Collection System. As part of the Performance Assessments, WSSC will quantify the reduction of I/I in each Sewer Basin that is the subject of an SSES. (The Performance Assessment shall be completed for each Sewer Basin no later than 18 months after complete implementation of the SR3 Plan for each Sewer Basin. The Performance Assessment report shall be prepared no later than 90 days after completion of the Performance Assessment, and submitted to MDE, EPA and the citizens listed as 'plaintiffs-intervenors' in the Consent Decree. The first Sewer Basin Performance Assessments are anticipated to begin with the completion of the first SSES basin rehabilitation work in 2019. As the above work is completed, the sewer models will be updated to re-assess system capacity constraints.

Plan Recommendation: WSSC Flow Modeling Integration

The Plan urges WSSC to integrate its flow modeling systems with the MC:MAPS geographic information system, which can provide direct access to modeling information WSSC needs from the County.

Transmission System Capacity Requirements and Moratorium Policies - For planning purposes, the WSSC conducts comprehensive analyses on a regular basis to determine the wastewater transmission needs within the WSSD. In conjunction with these analyses, Montgomery County has developed and adopted policies to prioritize the County's transmission capacity needs. WSSC must follow these criteria and policies for each basin classification, by designating part or all of each sewered drainage basin in the County as an **Adequate Capacity Basin,** a **Potential Overflow Basin,** or an **Existing Overflow Basin**, depending upon the transmission system's ability to handle sewerage flows. For existing and potential overflow basins these designations will be limited to the area above and tributary to the problem that causes the designation. References to the "Director" refer to the Director of the Montgomery County Department of Environmental Protection. For additional information on Transmission System Capacity Requirements and Moratorium Policies, please refer to Table 4-T3 on next page.

Table 4-T3: WSSC Sewerage Basin Designations and Policies

Sewerage Basin Designations, Descriptions, and Policy		
Adequate Capacity Basin	Descriptions	Part or all of any basin in which regular overflows and user backups have not been experienced and the observed or calculated peak sewage flow, allowing for an appropriate wet weather reserve, does not exceed the sewer operating capacity. Under WSSC Standard Procedure ENG-11-01, these are sewer basins that do not meet the criteria for the other two designations described below.
	Policy	WSSC may permit additional sewer hookups and commitments subject to the availability of adequate treatment capacity.
	Basins *Currently under this* Designation: *Dulles Interceptor, Little Falls, Rock Run, Seneca Creek, Watts Branch*	
Potential Overflow Basin	Descriptions	Under WSSC Standard Procedure, ENG-11-01, proposed development upstream generating 100,000 gallons or more base sanitary flow (BSF) that causes or exacerbates overflows in WSSC's collection system or facilities under existing dry weather flow conditions plus the 10-year WSSC Design Storm.
	Policy	WSSC, after consultation with the Director, should declare by resolution that it will **not** permit additional sewer hookups or commitments which would significantly increase the probability of sewer overflows or user backups until a facility plan is initiated or relief measures are under construction. The WSSC may continue to permit additional sewer hookups or commitments which would result in peak sewer operating capacity being exceeded if the calculated peak sewage flow will not result in an increased significant probability of overflows or user backups prior to completion of a relief project. The identical exemptions defined for immediate public health hazards, public service buildings, and individually-owned abutting lots in the policy for Existing Overflow Basins below also apply to this policy for Potential Overflow Basins.
	Basins *Currently under this* Designation: *Cabin John, Damascus, Muddy Branch, Northwest Branch/Patuxent North, Paint Branch, Rock Creek, Sligo Creek*	
Existing Overflow Basin	Descriptions	Part or all of any basin which is experiencing regular sewage overflows or user backups such that an immediate public health problem exists. "Regular" is defined as having already occurred and projected to occur more than once in ten years, other than maintenance-related occurrences. Also under WSSC Standard Procedure, ENG-11-01, proposed development upstream of identified (known or modeled) overflows in WSSC's collection system or facility under existing dry weather conditions plus the 2-year WSSC Design Storm.
	Policy	WSSC, after consultation with the Director, should declare by resolution that it will **not** permit additional sewer hookups or commitments which would increase the frequency of overflows or user backups until relief measures are underway with a projected completion date of a year or less. Exemptions: public service Buildings approved by the Director, and existing unconnected buildings creating immediate public health hazards as determined by the WSSC or the Director are exempt from any sewer hookup or commitment prohibition. Lots serving existing or proposed individually-owned single-family dwelling units abutting an existing sewer line and which the applicant owned or contracted for prior to the date of the moratorium resolution are exempt from any sewer hookup or commitment prohibition.
	Basins *Currently under this* Designation: *Rock Creek (above Reddy Branch Wastewater Pump Station)*	

I.B.3. Sanitary Sewer Overflows:

Sanitary sewers serve a vital function in the transport of wastewater from the customer to the treatment plant. Wastewater either flows by gravity or is pumped to the nearest wastewater treatment plant. WSSC's wastewater collection system is comprised of over 5,400 miles of sewer line and forty-four wastewater pumping stations. Sanitary sewer overflows (SSOs) occur when an obstruction partially or completely blocks the flow in a sewer main. Wastewater backs up in the line and eventually overflows from a manhole. There are a number of possible causes of SSOs including grease buildup, tree root penetration, pipe deterioration, undersized sewer lines, excess infiltration or inflow of stormwater and power outages at sewage pumping stations.

The greatest number of WSSC's overflows are due to blockages caused by grease, tree roots, or other foreign objects and a small percentage are caused by owner outages. Less than one percent are caused by "wet weather," i.e. the inflow of storm water. Montgomery County DEP and WSSC are fundamentally committed to excellence in the safeguarding of public health and the protection of the environment and are aggressively implementing a number of programs to minimize future sanitary sewer overflows.

MDE Reporting Requirements for SSOs

WSSC follows the Code of Maryland Regulations COMAR 26.08.10 for all SSO reporting.

USEPA- Consent Decree on SSOs Background

In December 2005, the Washington Suburban Sanitary Commission (WSSC) entered into a Consent Decree with the U.S. Environmental Protection Agency (EPA), the State of Maryland and four Citizen Groups on an action plan to significantly minimize, and eliminate where possible, sanitary sewer overflows (SSOs). The Citizens Groups were the Natural Resources Defense Council (NRDC), the Anacostia Watershed Society (AWS), the Friends of Sligo Creek (FOSC), and the Audubon Natural Society. On January 19, 2006, the Court entered the First Amendment to the Consent Decree to add Patuxent Riverkeeper to the definition of Citizens Groups. The sanitary sewer system is being inspected and rehabilitated. The agreement estimates approximately $1.3 billion in improvements to the WSSC's wastewater collection system, provides $4.4 million for additional environmental improvement projects and includes a $1.1 million civil penalty.

The following provides a short description of the requirements within each article of the remedial measures section of the Consent Decree and progress made to date:

Article 1: Collection System Characterization Report

WSSC shall submit a Map of the Collection System, identification of sewer basins that contribute flow to the Collection System, identification of sanitary sewer discharges (SSDs), and cause and conditions that contributed to SSDs. Each year in the Annual Report, the WSSC will submit an SSD Update Map and Report for the preceding year.

Progress to Date:

- Submitted Map and Report of the collection system showing the past 5 years of SSOs.
- Submitted SSD Update Map and Report in 10 Annual Reports.

Article 2: Collection System Evaluation

The WSSC shall perform Collection System Evaluations (CSEs). The CSE is to include Sewer System Evaluation Surveys (SSESs) on the SSES basins, and other inspections of the Non-SSES Basins and the implementation of a WSSC Trunk Sewer Inspection Program. The WSSC shall perform SSESs in nine sewer basins in eight years. The WSSC shall conduct a Trunk Sewer Inspection Program of all Sewers Segments 15-inches in diameter and larger. The WSSC shall evaluate the condition of sewer segments that are less than 15 inches in diameter and have been in service for more than 20 years by performing Closed Circuit Television (CCTV) and manhole inspections in the Non-SSES basins. Semi-annual and annual water quality monitoring will be

conducted in all sewer basins. The WSSC must CCTV any sewer segment of the collection system where an SSD has occurred.

Progress to Date:

- The Collection System Evaluations and the SSESs for nine basins shown in the following table have been completed.

SSES Basins	Status
Beaverdam	Regulators approved on June 8, 2011
Broad Creek	Regulators approved on December 6, 2006
Cabin John	Regulators approved on April 19, 2010
Little Falls	Regulators approved on February 14, 2013
Northeast Branch	Regulators approved on February 14, 2013
Parkway	Regulators approved on August 13, 2013
Piscataway	Regulators approved on March 20, 2012
Rock Run	Regulators approved on February 14, 2013
Watts Branch	Regulators approved on February 14, 2013

- Water Quality Monitoring Plan was submitted and approved by the MDE and the EPA. Conducted nine yearly or fifteen full (annual/semiannual) rounds of the Water Quality Sampling Reports.
- Inspected 825.21 miles of sewer as part of the initial Trunk Sewer Inspection Program. The Initial Program is 100% complete. Completed inspection of 17,218 manholes as part of the program. Phase II of the Trunk Sewer Inspection Program commenced during the second quarter of 2012. A total of 721.68 miles (87%) of trunk sewers were inspected as part of Phase II work.
- CCTVing is conducted on all segments where SSO's have occurred.
- CCTV'd and cleaned 1,145.23 miles (100% complete) of sewer in the Non-SSES basins.

Article 3: Fats, Oils, & Grease (FOG)

Develop & maintain a Food Service Establishment ("FSE") database based on Health Department databases, including a field for the compliance status of each FSE. Implement a Fats, Oils, and Grease (FOG) permit program for all grease generating FSEs. Perform baseline inspections of all FSEs within 5 years of the EPA and the MDE approval of the Modified FOG Program, and issue permits to all FSEs within 5 years. WSSC shall provide a report on the effectiveness of the WSSC's FOG control program.

Progress to Date:

- FOG Permit and Modified FOG Program Plan were submitted and approved by the MDE and the EPA. Updates of the implementation of the approved changes to the FOG Program are submitted annually.
- Plumbing Code approved. Implemented on May 1, 2007.
- The WSSC adopted new grease abatement regulations November 1, 2008.
- FOG permitting began on May 15, 2007. As of November 29, 2010, the WSSC issued 100% of the permits (5,149) and submitted certification to the MDE and the EPA.
- Submitted and obtained approval of current FSE's listing.
- Submitted update FOG Map annually.

- Submitted certification on the required completion of the 10%, 25%, 40%, and 55%. Submitted 100% Baseline Inspections on May 18, 2012. Inspected over 8,000 FSEs as part of the baseline inspections.
- Submitted and received approval from the EPA and the MDE on modifications to the FOG program specifically the Modified FOG Program Plan and the FSE Discharge Permit.
- Submitted and obtained approval from the MDE and the EPA, for an extension to the permit deadlines. New deadlines are:
    - Issue 60% of all permits by December 30, 2009 – complete
    - Issue 100% of all permits by December 30, 2010 – complete
    - Complete all baseline inspections by June 7, 2012 – complete
    - Submit report to the MDE and the EPA on the effectiveness of the FOG Program by December 7, 2012 – complete
    - The FOG Control Program Effectiveness Report was submitted on November 26, 2012. WSSC receives new FSE listings from the Health Department on an annual basis. Current total of FSEs in database are 10,714. WSSC issues permits to qualifying FSEs within 30 days of permit application. There have been 7,191 permits issued through December 31, 2014 and 4,740 FSEs actively open with a valid permit.

Article 4: Flow Monitoring

The WSSC shall perform flow monitoring to identify portions of the Collection System that may not have sufficient capacity to accommodate present or anticipated future flows, to plan sewer improvements, and to make determinations regarding future development of the Collection System. The WSSC shall maintain existing network of 120 flow monitors and 11 rain gauges.

Progress to Date:

- Submitted map identifying all locations of rain gauges and flow meters.
- Submitted certifications that the WSSC has complied with Article 4.B.1-8.
- Submitted updated map in the Annual Reports. There were 11 new meters installed, and four existing meters relocated in 2014.

Article 5: Collection System Modeling

The WSSC shall use a computer model of the Collection System to identify portions of the Collection System that may not have sufficient capacity to accommodate present or anticipated future flows, to plan sewer improvements, and to make determinations regarding future development of the Collection System. Computer modeling of at least 965 miles of sewer will be completed within five years.

Progress to Date:

- The Collection System Modeling was completed on August 17, 2007. The modeling requirement was completed ahead of the Consent Decree requirements.
- Certification of modeling completion is submitted with each SR^3 Plan.

Article 6: Sewer Basin Repair, Replacement, Rehabilitation Plans (SR^3) and Schedule

The WSSC shall prepare a SR^3 Plan for each sewer basin in the Collection System after completion of all sewer evaluations. The WSSC shall consider the following improvements as examples of work to be included and be performed in the SR^3 Plans:

Progress to Date:

The status of SR^3 plans are included in the following table

Submittal Date	SR^3 Plans	Regulatory Approval	Actual Basin Completion
11/15/2011	Beaverdam Branch	7/10/2012	
6/26/2009	Broad Creek	4/19/2010	
8/17/2009	Cabin John	4/19/2010	
6/2/2011	Dulles Interceptor	7/10/2012	
6/2/2011	Horsepen Branch	7/10/2012	
7/16/2010	Lower Anacostia	12/20/2010	
12/3/2010	Mattawoman	10/20/2011	7/10/2015
6/2/2011	Monocacy	7/10/2012	
6/2/2011	Muddy Branch	7/10/2012	
6/26/2009	Northwest Branch	4/19/2010	
5/22/2009	Oxon Run	4/19/2010	
3/8/2010	Paint Branch	7/28/2011	
6/2/2011	Patuxent Center	7/10/2012	10/2/2014
6/26/2009	Rock Creek/Patuxent North	4/19/2010	
6/2/2011	Seneca Creek	7/10/2012	
5/22/2009	Sligo Creek	4/19/2010	
6/2/2011	Western Branch	7/10/2012	
6/21/2012	Piscataway	11/5/2012	
12/13/2012	Little Falls	08/13/2013	
12/13/2012	Watts Branch	08/13/2013	
12/13/2012	Rock Run	08/13/2013	
1/24/2013	Northeast Branch	08/13/2013	
3/27/2013	Parkway	08/13/2013	

- On April 15, 2010, submitted two year extension request for specific manholes as part of the re-evaluation of the Rock Creek and Broad Creek basins, approved by the MDE and the EPA. All work is complete.
- On September 15, 2010, the four month extension request for the Rock Creek/Patuxent North SSES Re-evaluation work was submitted and approved by EPA. All work is complete.
- Submitted on May 16, 2011, SR^3 Plan addenda for the nine previously submitted SR3 Plans. Received approval from MDE and EPA on April 4, 2012.

Article 7: Performance Assessments

The WSSC shall conduct a Performance Assessment of the work performed under Article Two and Six to determine the effectiveness of the evaluations and corrective actions performed in each basin. The assessment must include an evaluation of the number and causes of SSDs and Building Backups, quantify the reduction of Inflow/Infiltration (I/I) in each Sewer Basin that is the subject of an SSES, determine whether the WSSC has adequately prioritized rehabilitation work, evaluate the type and effectiveness of the Preventive Maintenance and Proactive Maintenance practices, and evaluate the effectiveness of the frequency of Preventive Maintenance and Proactive Maintenance practices.

Progress to Date:
Performance Assessment (PA) will start when basin rehabilitation is complete (no later than 18 months after complete implementation of each SR^3 Plan).

Basin Name	Start PA	End PA (Deadline)	Submit PA
Patuxent Center	10/2/2014	4/2/2016	7/1/2016
Mattawoman	7/10/2015	1/10/2017	4/10/2017

Article 8: Illegal Stormwater Discharges
The WSSC shall through the use of CCTV and smoke and dye testing during the performance of the Collection System Evaluations actively seeks to identify and eliminate Illegal Stormwater Discharges.

Progress to Date:
- Procedure for enforcement strategy is complete.
- No Illegal Stormwater Discharges have been identified thus far.

Article 9: Information Management Systems
The WSSC shall maintain an Information Management System which will include an MMIS and GIS system to track sanitary sewer discharges (SSDs) and identify sources.

Progress to Date:
- Submitted certification that the Information Management System complies with the minimum requirements.
- Submitted annual certifications that the WSSC has complied with Article 9.B (Update GIS within 120 days of becoming aware that attribute data is incorrect or incomplete).

Article 10: Pump Stations
The WSSC shall continue to implement a Pump Station Preventive Maintenance Program and periodically review and update Pump Station standard operating procedures. WSSC must submit 30, 90 or 180 day reports for Pump Station related sanitary sewer discharges (SSDs). The WSSC shall submit Facility Plans for Anacostia and Broad Creek. Every 5 years the WSSC shall reevaluate its Pump Stations to assure that each Pump Station is of sufficient size and capacity to handle expected wastewater flows.

Progress to Date:
- WSSC continues to submit reports for Pump Station sanitary sewer discharges (SSDs).
- Anacostia WWPS Storage Facility Plan was approved by the MDE and the EPA. Final Construction Completion on December 30, 2013.
- Broad Creek Facility Plan was approved by the EPA and the MDE. Submitted request for extension with Force Majeure provisions on November 2, 2011, for specific deadlines in the plan and schedule because of WSSC's inability to secure permit approvals. The request for an extension due to Force Majeure conditions was approved by EPA and MDE. A revised Facility Schedule will be submitted upon receipt of permit approvals. The remaining three construction contracts are waiting for environmental permit approval to start construction.
- Submitted annual certifications that the WSSC has complied with Article Ten, B.4 for review and update of the Pump Station Standard Operating Procedures.
- Completed 47 Pump Station Re-evaluations for the first five years in February 2009. Submitted the Pump Station Capacity Evaluation Report in the 2010 Annual Report.
- The subsequent Pump Station Capacity Re-evaluation Report for the second five-year period was completed and submitted with the Annual Report for December 2015.

Article 11: Collection System Operation and Maintenance Plan

The WSSC has submitted a comprehensive Operation and Maintenance Plan for the Collection System, including its Gravity Sewer Segments, Force Mains, Pump Stations, and components to provide for the proper operation and maintenance of equipment. The WSSC shall evaluate the collection system using the criteria set forth in the Consent Decree within 5 years of implementing the O & M Plan in Phase I and II. In Phase III, every five years the WSSC will clean additional sewers that reach at least 21 years of service during the prior 5 years and are not cleaned as part of Phase I and II.

Progress to Date:

- Operations and Maintenance Plan was submitted and approved by the MDE and the EPA.
- Phase I Sewer Segment Cleaning in Non-SSES Sewer Basins is 100% complete. (1,145.23 miles cleaned)
- Phase II Sewer Segment Cleaning in the SSES Basins is 100% complete. (1,540 miles cleaned)
- Phase III Sewer Segment Cleaning commenced in March 2012. As of December 31, 2014, 282.39 (81%) miles have been cleaned, total miles to be cleaned is 350 miles.

Article 12: Emergency Response Plans (ERPs)

The WSSC developed and implemented Emergency Response Plans (ERPs) to adequately respond to the occurrence of SSDs and Buildings Backups.

Progress to Date:

- ERPs were submitted and approved by the MDE and the EPA
- Submitted revised ERPs in the Annual Reports
- Submitted certifications stating the WSSC has complied with elements of the approved ERPs annually.

Article 13: Reporting and Record Keeping

The WSSC shall provide the following information for Sanitary Sewer Discharges (SSDs):

- Verbal reports of all SSDs within 24 hours to the MDE
- A written report for all SSDs within five days to the EPA and the MDE
- Post all written reports on the WSSC web site within 10 days

Progress to Date:

- Submitted annual certifications stating the WSSC has complied with the requirements of Article 13, B.1-2, and C-F.
- Building Backup reports are submitted quarterly.

Supplement Environmental Projects (SEP)

The WSSC shall purchase Patuxent Reservoir Buffer Properties and Easements for Water Supply Protection. The WSSC has finalized and signed a Memorandum of Understanding (MOU) with the Maryland Environmental Trust (MET). Under the MOU, MET will develop outreach tools, contact landowners, bring promising prospects to the WSSC, negotiate terms, record deeds, and monitor land in perpetuity. The WSSC will assist MET in targeting landowners by assisting with GIS, public outreach, and appraisals.

In addition, the Western Branch WWTP shall denitrify by methanol addition to the treatment stream during the next three winter seasons. The winter season is defined as November through March.

Progress to Date

- The Patuxent Reservoir SEP scope of work was approved by the MDE and the EPA. The SEP was complete by December 7, 2010.

- As of December 31, 2010, $3,397,881.16 was spent for land purchases, settlement fees, environmental site assessments, appraisals and title searches. The SEP Completion Report was approved by the MDE and the EPA.
- The Western Branch WWTP denitrification SEP was complete March 31, 2007. The Western Branch WWTP denitrification SEP was approved by the MDE and the EPA.

2015 Amendment to Consent Decree

In November 2015, WSSC requested an amendment to the Consent decree to extend the timeframe to complete specific facets of the work that have been delayed due to permitting issues for work to be performed within wetlands, at stream crossings, Federal and State Parklands, or other similarly sensitive areas. Although permit applications have been submitted to the applicable agencies, the extent and complexity of the permit approval process has required more time than originally anticipated. A six-year extension for this specific work was requested. Approval from the U.S. District Court was authorized in July 2016.

MDE Reporting Requirements for SSOs

Furthermore, the State of Maryland has placed new emphasis on its requirement to report all SSOs to the Department of the Environment (MDE) within twenty-four hours of their occurrence, as well as the need to notify the public whenever an SSO has any significant potential to affect public health or the environment. MDE has provided guidance suggesting that wastewater utilities need to work closely with local environmental and health departments to identify any such potential impacts and to notify the public when warranted. WSSC, in conjunction with Montgomery and Prince George's Counties, has developed procedures for this coordination and public notification.

Plan Recommendation: Development of a Prioritized Listing of SSES Basins and a Related Financial Plan by WSSC
WSSC has been addressing a comprehensive maintenance, operations and management system for the past ten years. These issues affect capital expenditures, sewer overflow conditions, and regional agreements. This Plan suggests that WSSC develop a prioritized list of SSES basins and a financial plan to address the needs these studies reveal.

I.B.4. Sewer Sizing Policies:

WSSC's Design Manual provides both general and specific sewer design criteria and designates the WSSC Development Services Group with the responsibility for sizing the new sewer mains to be constructed within a proposed development. In general, sewer systems are designed for ultimate flow within the drainage area unless the WSSC determines that the County's land use policies allow for a lesser requirement.

For sewers serving a complete sewershed, the ultimate sewage flow is determined by assuming that the entire basin will develop in accordance with approved master plans. Sewer systems which serve only part of a sewershed are sized to serve the entire sewershed. Normally, sewer systems are designed to function by gravity. In certain circumstances gravity sewers may be allowed to flow under a slight surcharge condition, but will be determined on a case-by-case basis.

I.B.5. Pressure Sewer Systems:

Where gravity sewers are not appropriate for use, WSSC can approve the use of pumping stations and force mains or grinder pumps and low-pressure sewers. Pumping systems are used where there are no receiving gravity sewers lower in a drainage basin (as in the Hawlings River watershed), or where

the construction of gravity mains needed to connect with the existing gravity sewage system is either uneconomical or environmentally unacceptable.

Grinder Pumps:

Grinder pumps are small, individual package pumping units connected to small-diameter low-pressure sewer mains and are used to provide sewer service in areas where gravity sewer is not feasible and is recommended by WSSC based on policies and procedures. Grinder pumps work by grinding the sewage in a slurry which is then pumped into the low pressure sewer main. Most of the grinder pump applications in the Washington Suburban Sanitary District (WSSD) provide service to an individual home or user. They are usually located within private property and are owned, maintained, and operated by the homeowner.

The design and construction of low pressure sewer systems with grinder pumps are based on the assumption that the specified pumps will be installed, maintained, and replaced in-kind (when necessary) in a satisfactory manner by the homeowner. Conceptually, this should result in a fairly reliable wastewater conveyance system; however, the potential exists for a lower level of service than that expected of more conventional systems. Grinder pumps are equipped with alarms that notify the homeowner of equipment malfunctions; however, the alarms are not fail-safe and conditions could exist whereby a sewage backup within the home occurs without the homeowner being warned in advance. Back-ups could also arise from the homeowner's lack of proper grinder pump maintenance. Grinder pumps should be checked regularly for proper operation by a qualified service provider on a regular basis. Grinder pump maintenance is an added expense to the homeowner. Since grinder pumps operate from the electricity supplied from each individual home, homeowners must be cognizant that during power outages they should not use faucets, toilets, tubs and showers to avoid sewage back-ups in their home unless they have a back-up power source such as a portable or whole-house generator. Without such a power back-up, it can be extremely inconvenient during long power outages. The cost of electricity and generator power sources is an added expense to the homeowner. The life of a grinder pump varies and depends partly on the homeowner's level of maintenance. Pumps will have to be replaced periodically at the homeowner's expense. Replacing the grinder pump with another model different than what was originally specified can lead to system problems not only for the homeowner but potentially for other grinder pumps connected to the same pipe network since the pumps are designed to work in unison. A replacement pump that operates at a lower shut-off head than the previous pump could cause the pump output to be less or shut-off when many pumps within the system are running. Conversely, a replacement pump that operates at a higher shut-off head than the previous pump could affect other grinder pumps within the network by reducing their output. Both conditions could cause sewage back-ups within homes. Low pressure sewer systems that contain long distances of pipeline between the pumps and the outfall into the closest gravity sewer can result in long-detention times of sewage within the pressure sewer. This can create odorous conditions at the outfall and a nuisance to nearby homeowners. In summary, it is incumbent upon each individual homeowner to properly install, maintain and replace their grinder pump to maximize the reliability of the low pressure sewer s. Although it may cost less to construct low pressure systems with grinder pumps, publicly-owned centralized pumping stations are considered to provide a higher level of service to the WSSC customer due to redundant pumps, emergency back-up power, and shorter pipeline detention times.

As a result of the above issues, WSSC has established procedures on selecting grinder pumps in lieu of more conventional systems. Effective January 2005, WSSC instituted a Standard Procedure, **ENG 04-10**, which currently governs the use of grinder pumps in the WSSD. The procedure supersedes the previous policy (PD-94-01) and clarifies WSSC policy concerning the implementation of grinder pumps for sewer service.

- Establishes that grinder pumps can only be used when gravity service or service via a centralized wastewater pumping station are not feasible;
- Establishes that a Grinder System Review Committee reviews, on a case-by -case basis, development projects proposing the use of grinder systems;
- Requires that an applicant/engineer provide sewer service alternatives analysis for WSSC review for development proposed with 50 or more grinder pumps;
- Clarifies and documents current WSSC practice regarding the use of grinder systems for non-residential customers;
- Provides procedures established to minimize and mitigate the potential for odor problems in grinder systems.

I.B.6. Infiltration and Inflow (I/I) Control Program:

Infiltration of groundwater into aging, defective or damaged sewers and the inflow of water from sources such as direct connections of roof leaders, area drains, drains from springs and swampy areas, and manhole covers may contribute to sewage collection system overloading or may deplete the capacities of wastewater conveyance and treatment facilities.

WSSC has reviewed its collection system data and is aware of excessive I/I in several of the sewer basins in the WSSD. Over the past several years, WSSC performed comprehensive sewer studies in the County's Rock Creek, Cabin John, Little Falls, Rock Run and Watts Branch Basins. The resulting recommendations from the studies included corrective actions for specific problems identified in manholes and sewer pipelines. Work is currently ongoing throughout the County to repair, replace and rehabilitate deteriorating elements of the system through the Sewer Reconstruction Program.

The I/I control program also directly supports renewed federal initiatives for controlling Sanitary Sewer Overflows (SSOs) which include facility and manhole overflows as well as basement back-ups. Using I/I assessment techniques, WSSC explores the causes for each SSO event, and seeks resolutions to prevent future occurrences. Survey tools deployed during I/I or related work (physical inspection of manholes, TV inspection of sewers) yield rehabilitation recommendations which are implemented in the Sewer Reconstruction Program. In this manner, WSSC routinely detects and corrects leaking as well as non-leaking structural defects.

I.B.7. Industrial Pretreatment Program:

WSSC implements a federally mandated pretreatment program, the Industrial Discharge Control Program (IDCP). The IDCP has four primary goals:

- To monitor and control the discharge of industrial waste into the sanitary sewer system.
- To prevent the discharge of pollutants which will interfere with the operation of wastewater treatment plants, including interference with sludge use and disposal.
- To prevent the discharge of pollutants which will pass through the treatment works or otherwise be incompatible with such works.
- To improve opportunities to recycle and reclaim municipal and industrial wastewater and sludge.

The program also helps protect WSSC personnel and WSSC sewerage systems by regulating the discharge of toxic, corrosive, and other prohibited substances into the sanitary sewer. IDCP requirements apply to all industrial users within the WSSD, and include those industrial users whose wastewater is treated at the District of Columbia's Blue Plains WWTP and Charles County WWTP. WSSC regulates industrial users in the WSSD through a variety of activities including field investigations and sampling, permitting, compliance reviews, and enforcement measures. In order to comply with WSSC discharge limitations, some industrial users are required to install pretreatment equipment to treat their wastewater prior to discharging it to WSSC's sanitary sewers. In some cases, the equipment

may be relatively minor (e.g., silver recovery units or oil/water separator); in other cases, the required level of pretreatment can be extensive.

WSSC achieves the pretreatment program's goals by performing the following primary functions:

- **Investigation/Monitoring** -- WSSC conducts on-site investigations of industrial users, evaluating industrial user processes, chemical usage, types and volumes of wastes generated, and methods of waste disposal. Compliance monitoring is conducted independently of the industrial user to determine whether their discharges meet WSSC standards. Grab and composite samples of the industrial user's process wastewater are collected using manual and automatic sampling methods. Analytical results are then compared to WSSC limits to determine the industrial user's compliance status.
- **Discharge Permit Applications** -- Discharge permit applications are sent to industrial users to determine if they should be permitted through the IDCP. WSSC issues discharge authorization permits to those industries qualifying as significant industrial users. The discharge permits authorize industrial users to discharge their process wastewater to WSSC's sanitary sewer system, specifying discharge limitations, restrictions and self-monitoring requirements. The permitted industrial user is required to perform monitoring of its wastewater discharges and report the results to WSSC. IDCP staff review the user industry's self-monitoring reports to determine compliance with its authorized discharge limitations. This review also assures that the sample collection, preservation, and analyses performed by, or on behalf of, the industrial user are conducted in accordance with approved methodologies and that the results accurately represent the industry's discharges.
- **Enforcement Action** -- WSSC takes enforcement actions against those industrial users who violate discharge limits or fail to comply with other regulatory requirements. Enforcement actions can include notices of violation, civil citations with monetary penalties, administrative orders, and termination of water/sewer service.
- **Data Management** -- Through its pretreatment program, WSSC maintains electronic files and databases of information on industrial users. This information includes the results of industrial investigations, analytical data from the industrial user as well as WSSC, permit information (including limitations and special conditions), and enforcement actions taken against violators. WSSC recovers a portion of the pretreatment programs costs through an annual fee assessed to the permitted industrial users. The varying annual fees are based on the anticipated level of effort associated with the industrial users within specific industrial categories. In addition to activities associated with regulating industrial users, WSSC also evaluates the wastewater characteristics of its wastewater treatment plants (Damascus, Parkway, Piscataway, Seneca and Western Branch). On an annual basis WSSC also conducts sampling of the influent and effluent of each plant for EPA designated priority pollutants. The analytical data is used to develop local limits for industrial users and to evaluate treatment plant compliance with water quality standards. WSSC is also required to report its monitoring results for each treatment plant to the Maryland Department of the Environment.

I.B.8. Fats, Oils and Grease (FOG) Program:

WSSC implements a FOG Program that is aimed at controlling fats, oils, and grease discharges from Food Service Establishments (FSEs) and to educate the public about proper disposal of FOG from their homes. Based on the Environmental Protection Agency's (EPA's) records, it has been estimated that FOG contributes to 40-60% of all Sanitary Sewer Overflows (SSO's) nationwide. Although WSSC had implemented a FOG Program since the 1990's, a late 2005 mandate allowed the program to grow and become more formal.

The creation of the modern WSSC Fats, Oils, and Grease (FOG) Program was necessitated by the Sanitary Sewer Overflow Consent Decree negotiated with the United States Department of Justice, the Environmental Protection Agency, and the Maryland Department of the Environment. The

Consent Decree includes requirements to proactively inspect all food service establishments (FSEs) within the WSSC service area, and take appropriate enforcement action against those facilities which do not comply with the WSSC's Plumbing and Fuel Gas Code with regard to the installation of treatment devices and compliance with discharge standards. Overflows caused by fats, oils and/or grease blockages are a primary area of focus for the FOG Program.

The basics of this Program includes monitoring and controlling the discharge of fats, oils, and grease from FSEs, investigating sanitary sewer blockages and overflows caused by FOG discharges, and initiation of enforcement action to ensure appropriate corrective measures are taken. Staff performs investigation, permitting, and monitoring activities to ensure compliance with Federal, State, and WSSC discharge requirements by FSEs and other WSSC non-domestic customers. Program staff also perform customer outreach and provide compliance assistance to regulated customers, and they also administer necessary billing functions associated with the recovery of costs for FOG Program implementation. Staff ensures that all periodic FOG-related activities are reported to the appropriate State and/or Federal agencies (via the Wastewater Collection System Group) as required by the Consent Decree.

When an FSE receives a County Health Department license to operate, it also must be reviewed for potential fats, oils and/or grease discharges of a measurable (greater than 0.01%) quantity. WSSC will determine if the FSE is exempt from the standard, is to only follow “Best Management Practices” (BMPs) for compliance or must install a grease abatement system (GAD) to complement the required BMP practices. Examples of FSEs required to have GADs include, but are not limited to restaurants, cafeterias, hotel kitchens, church kitchens, school kitchens, hospital cafeterias, bars, convenience stores, food courts in shopping centers, ice cream parlors, specific types of coffee shops, small dairy shops, deli counters, food stores, and catering service kitchens.

The FSE must comply with the WSSC Plumbing and Fuel Gas Code in all aspects of FOG production, capture and treatment/disposal at its facility. The WSSC FOG staff will outline the regulatory requirements applicable to the FSE upon an initial inspection of the site.

Since GADs must be maintained to be effective, WSSC also monitors the disposal practices of the FSEs, including their use of contractual FOG disposal companies and waste haulers. WSSC does not clean, collect, store nor dispose of FSE FOG produced from the FSE’s GAD. It is the full responsibility of the FSE to acquire the licensed and certified FOG collection and disposal contractor or company.

I.B.9. Wastewater Treatment System Requirements - General Provisions:

In addition to discharge and construction permit requirements on existing and new treatment plants administered by the State of Maryland, Montgomery County shall review and approve all new facilities and all significant modifications to existing facilities within the County. All new community and multi-use treatment systems and points of discharge shall be specifically delineated in this Plan prior to the issuance of final construction and discharge permits by the State of Maryland. In addition, the County government may require stricter levels of treatment where warranted by projected receiving water quality impacts resulting from the discharge. These requirements also apply to all individual systems exceeding 1,500 gallons per day average daily flow and all individual systems of any size requiring a groundwater or surface water discharge permit, except heat pump discharges. Permit applicants have the burden of adequately demonstrating to the County that the proposed facilities will not have a significant, detrimental impact on the surrounding community or receiving waters.

Proposed modifications to existing treatment facilities, including both system upgrading and expansion, are also subject to the County's approval. This includes any proposed community multi-

use or individual system treatment facility or discharge point modification which requires a State construction and/or discharge permit. Any modifications requiring MDE's review and approval shall also require prior incorporation of the proposed modification in this Plan, as either a text amendment or as an adopted capital improvement program (CIP) project. Specific proposals for new or modified facilities shall be submitted to the Director of DEP with supporting documentation as required by the Director.

The State of Maryland, as part of its efforts to improve the ecological health of the Chesapeake Bay, is investigating the impact of lowering the wastewater treatment plant nitrogen discharge standard from 8 milligrams per liter (mg/l) to 3 mg/l. This new standard would affect all of the wastewater treatment plants serving Montgomery County, and would have significant financial implications for WSSC and DC WATER with regard to the facility upgrades and treatment process improvements needed to comply with the lowered standard.

I.B.10. Financing Sewerage Systems:

WSSC uses several methods to fund the construction and operation of the sewerage system. Detailed information concerning WSSC's funding methods is included in Chapter 1, Section IV.A. The current WSSC CIP budget document, and those for some prior years, are available through WSSC's budget webpage at https://www.wsscwater.com/budget.

I.C. Existing and Planned Sewerage Systems and Projected Needs:

The sewage collection and conveyance system within the WSSD consists of about 5,500 miles of gravity and force mains ranging from 6 to 102 inches in diameter and 52 wastewater pumping stations, including 26 stations in Montgomery County. This section presents an overview of the County's long-term sewerage system needs and anticipated constraints within each service area and individual sewershed. The anticipated sewerage system needs and constraints discussed in this section focus on the major components of WSSC's transmission and treatment facilities. The information presented here is based on the results of various studies as referenced at the end of this chapter.

The planned projects programmed in the WSSC CIP (Capital Improvements Program) are intended to address the County's current and/or short-term wastewater conveyance or treatment needs. The CIP projects include funding and schedules for planning, design, land acquisition, and construction of facilities. These facilities often support new development in accordance with the County's approved plans and policies for orderly growth and development. Other projects are for system improvements and/or for compliance with environmental regulations and policies.

Flow projections within the WSSD are based on the County's latest adopted master plans and demographic projections for development and approved service areas for future growth. Based on the Maryland-National Capital Park and Planning Commission (M-NCPPC) household and employment growth estimates, WSSC develops flow projections to determine the approximate time a planning decision for each facility should be made. Wastewater flow forecasts are developed from detailed analyses of existing flow records and projected additional future flow based on projected demographics, wastewater flow per household and per employment, and other factors such as infiltration (extraneous groundwater) and inflow from rainfall. Population forecasting and flow projection are based on the best available data at the time the planning is conducted. WSSC re-evaluates actual conditions, project needs, etc. before implementing proposed projects. The latest projected flows for individual sewered basins in Montgomery County are provided in the latter sections of this Plan. WSSC' evaluation of the County's long-range sewerage system needs are based on these projections.

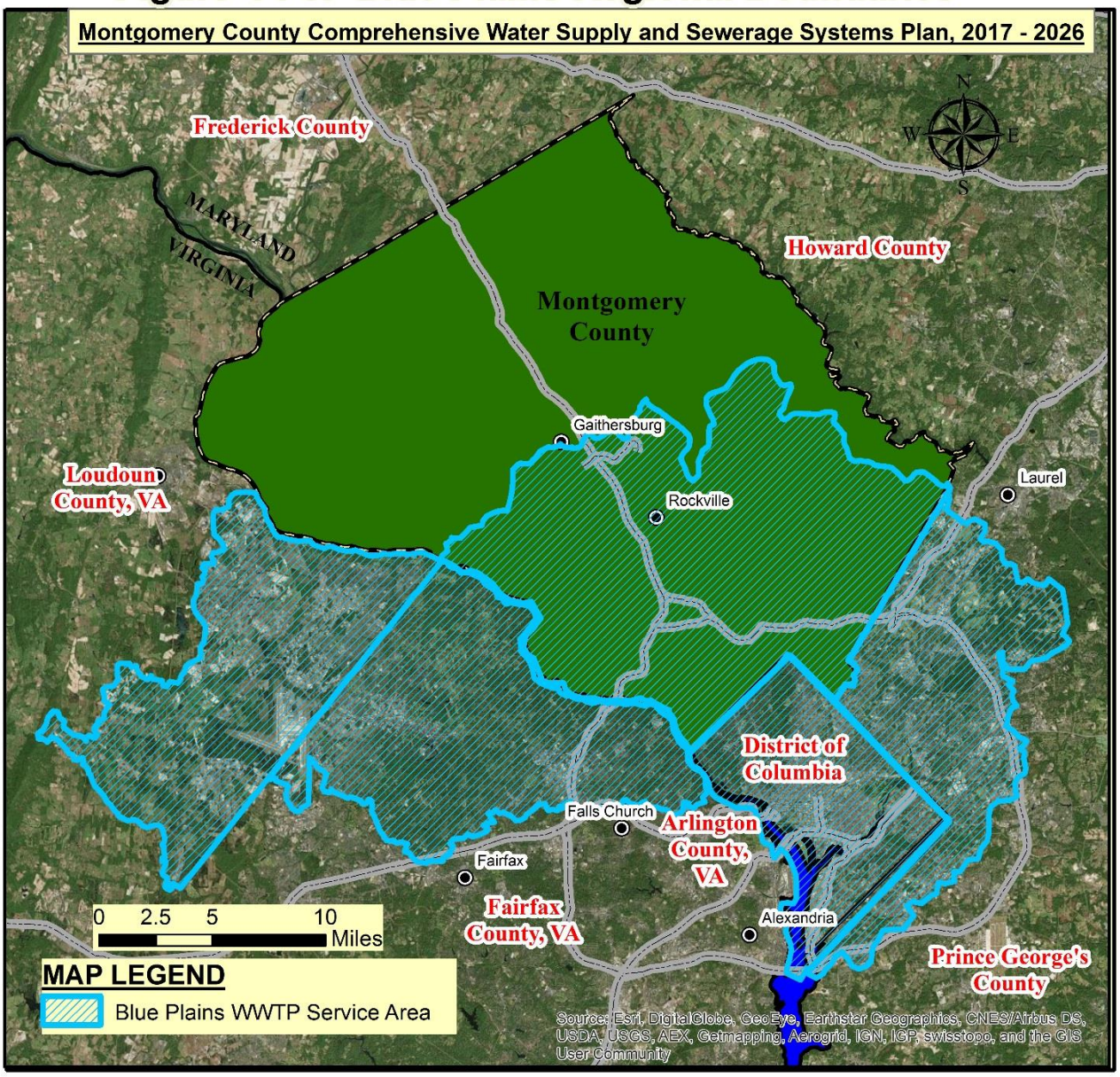
"Planned Sewerage Systems" refers to those projects which have been approved and programmed in a relevant Capital Improvements Program (CIP). A summary of capital projects planned and currently underway to upgrade and expand the sewerage systems serving the County and/or to address facility

maintenance needs are listed in the current CIP budget document and are available through WSSC's budget webpage at: https://www.wsscwater.com/budget

I.C.1. Blue Plains Service Area:

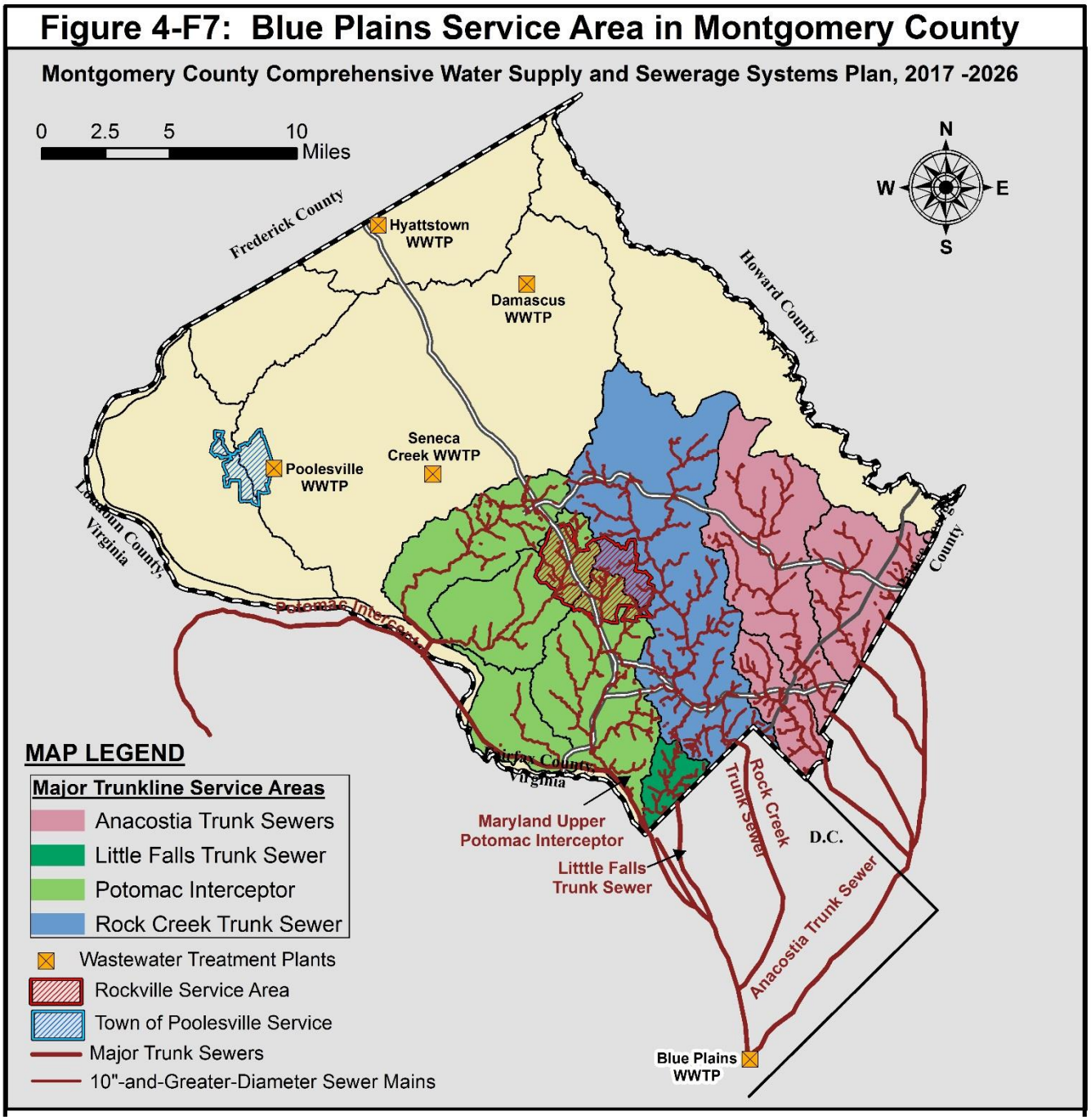
Approximately 85% of the municipal wastewater generated in Montgomery County is treated at the Blue Plains WWTP, a facility located along the Anacostia and Potomac rivers in Washington, D.C., and operated by DC WATER. The Montgomery County's flow contribution to the Blue Plains WWTP accounts for approximately 40 percent of the total flow at the facility. The Blue Plains Service Area in Montgomery County encompasses much of the central and eastern part of the County. The Blue Plains service area also includes the Rockville Service Area. More detailed information on the City of Rockville's sewerage systems is included in Section II of this Chapter. (See Figure 4-F6).

Figure 4-F6: Blue Plains Regional Boundaries



I.C.1.A. Blue Plains Service Area Collection and Conveyance Systems:
The principal sewer lines which convey the County's wastewater to the Blue Plains WWTP include the Potomac Interceptor (PI), the Maryland-Upper Potomac Interceptor (MUPI), the Rock Creek Trunk Sewers, the Little Falls Trunk Sewer, and the Anacostia Trunk Sewers. The general location and the sewer basins served by these major sewer lines are shown in Figure 4-F7.

Figure 4-F7: Blue Plains Service Area in Montgomery County



All the major sewer lines transmitting flows to the Blue Plains WWTP are subjected to annual average and peak flow limitations identified in the Intermunicipal Agreement (IMA) of 2012. The IMA annual average and peak flow limitations for the above sewer lines are listed in Table 4-T4.

Table 4-T4: Average Basin Flows and IMA Limitations for the Montgomery County Portion of the Blue Plains Service Area

Sewer Basin	Receiving Interceptor	IMA Limit (MGD)	
		Annual Average	Peak
Muddy Branch	PI	8.4	28.3
Cabin John	MUPI & PI	16.4	60.3
Rock Run	PI	1.3	5.6
Watts Branch	PI	5.8	16.5
Little Falls	UPI	7.6	20.8
Rock Creek	RCTS	33.5	56.6
Other Basins*	Anacostia & PI	NA	NA
Total to Blue Plains WWTP		NA	NA

*Other Basins include flows from Anacostia and direct connections to the Potomac Interceptor.

- All data include flows from the City of Rockville.
- Anacostia is a Bi-County Basin and capacity is available to both Counties on first come-first served basis.
- Flows from Montgomery County to the Anacostia Trunk Sewer are from the Northwest Branch, the Paint Branch, and the Sligo Creek Sewer basins.

PI = Potomac Interceptor MUPI = Maryland Upper Potomac
RCTS = Rock Creek Trunk Sewers NA = Not Analyzed or Not Applicable

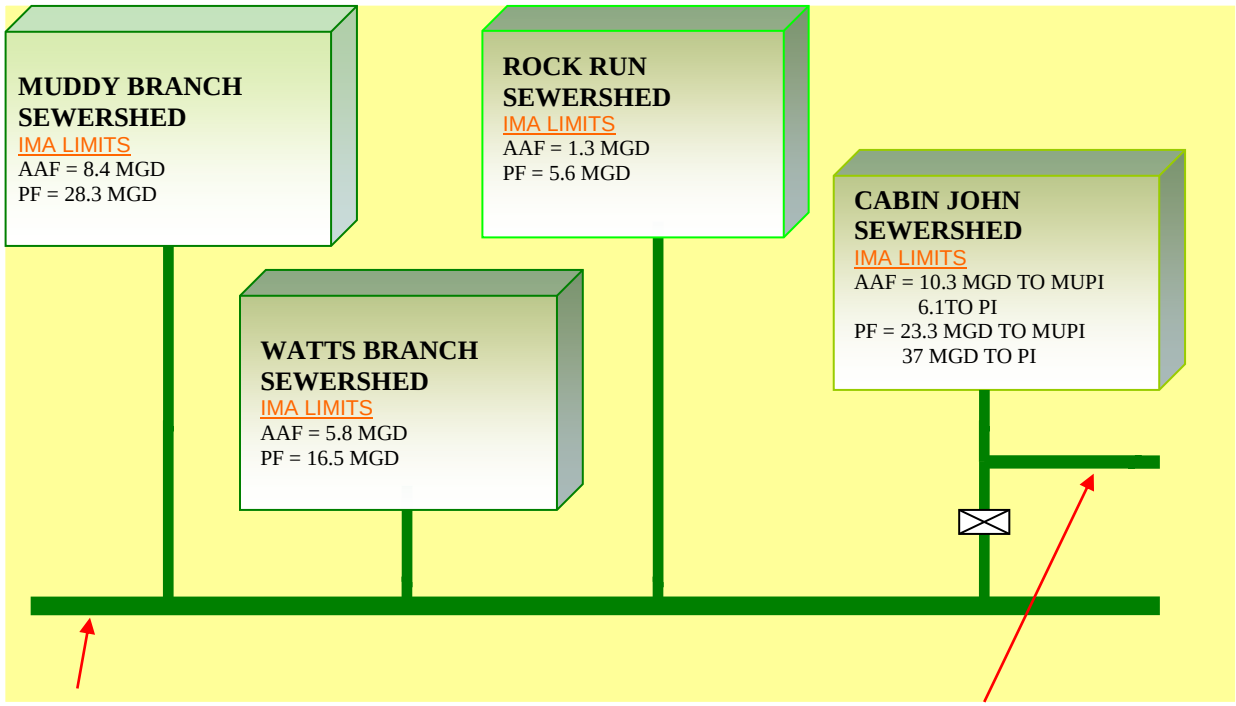
I.C.1.A.i. Potomac Interceptor and Tributary Sewersheds:

In June 1960, the U. S. Congress authorized the U.S. Corps of Engineers to design and construct the Potomac Interceptor (PI), an interceptor sanitary sewer to connect Dulles International Airport with the District of Columbia system. The PI system was built with sufficient transmission capacity to provide sewer service for projected community growth and development in the adjacent areas in the States of Maryland and Virginia. Because of the original purpose of this sewer, it is also referred to as the "Dulles Interceptor" by some of its user jurisdictions. The PI was completed in 1963 and consists of 42 miles of sewer line. DC Water is charged with the operation and maintenance of the interceptor, paid for as defined in the Intermunicipal Agreement (IMA) of 2012.

The Potomac Interceptor receives wastewater from various sewerage basins (sewersheds) along the length of its main stem, and drains into the Upper Potomac Interceptor Relief Sewer (UPIRS) in the District of Columbia. To take full advantage of its hydraulic capacity and to control the flow, the PI has been interconnected at several locations with other principal sewers such as the Maryland-Upper Potomac Interceptor (MUPI). Sewersheds served within Montgomery County by the PI include the Muddy Branch, Watts Branch, and Rock Run basins. The Maryland Upper Potomac Interceptor (MUPI) is the upstream continuation of the UPIRS upstream across the District boundary where it carries flow principally from the Cabin John sewershed. Flows in excess of the MUPI's capacity are diverted to the PI through the PI-MUPI interconnection. (See Figure 4-F8.)

Flows from the County's sewersheds to the PI are regulated through the Intermunicipal Agreement (IMA) of 2012. Figure 4-F8 is a schematic of the Potomac Interceptor and the tributary sewersheds from Montgomery County along its main stem. Also shown are the IMA flow limitations. Existing and projected flows from various sewersheds in Montgomery County to the PI relative to the IMA flow limitations are also discussed in this section.

Figure 4-F8: Montgomery County Sewage Flow to the Potomac Interceptor



All sewage flows are in millions of gallons per day (MGD)
AAF = Annual Average Flow and PF = Peak Flow (2012 IMA)

In 2000, the Blue Plains user jurisdictions tasked COG to develop a dynamic hydraulic model of the PI in order to adequately characterize the existing flows in the interceptor and evaluate the capacity of this vital regional sewerage facility. The dynamic model was completed and its results presented to the user jurisdictions in 2002. The model's analyses indicate that the PI has enough capacity to convey flows to Blue Plains for the following 25 years, The PI dynamic hydraulic model will be useful as a tool to evaluate and plan various strategies for managing future wastewater flows in the basins that contribute flows to the PI.

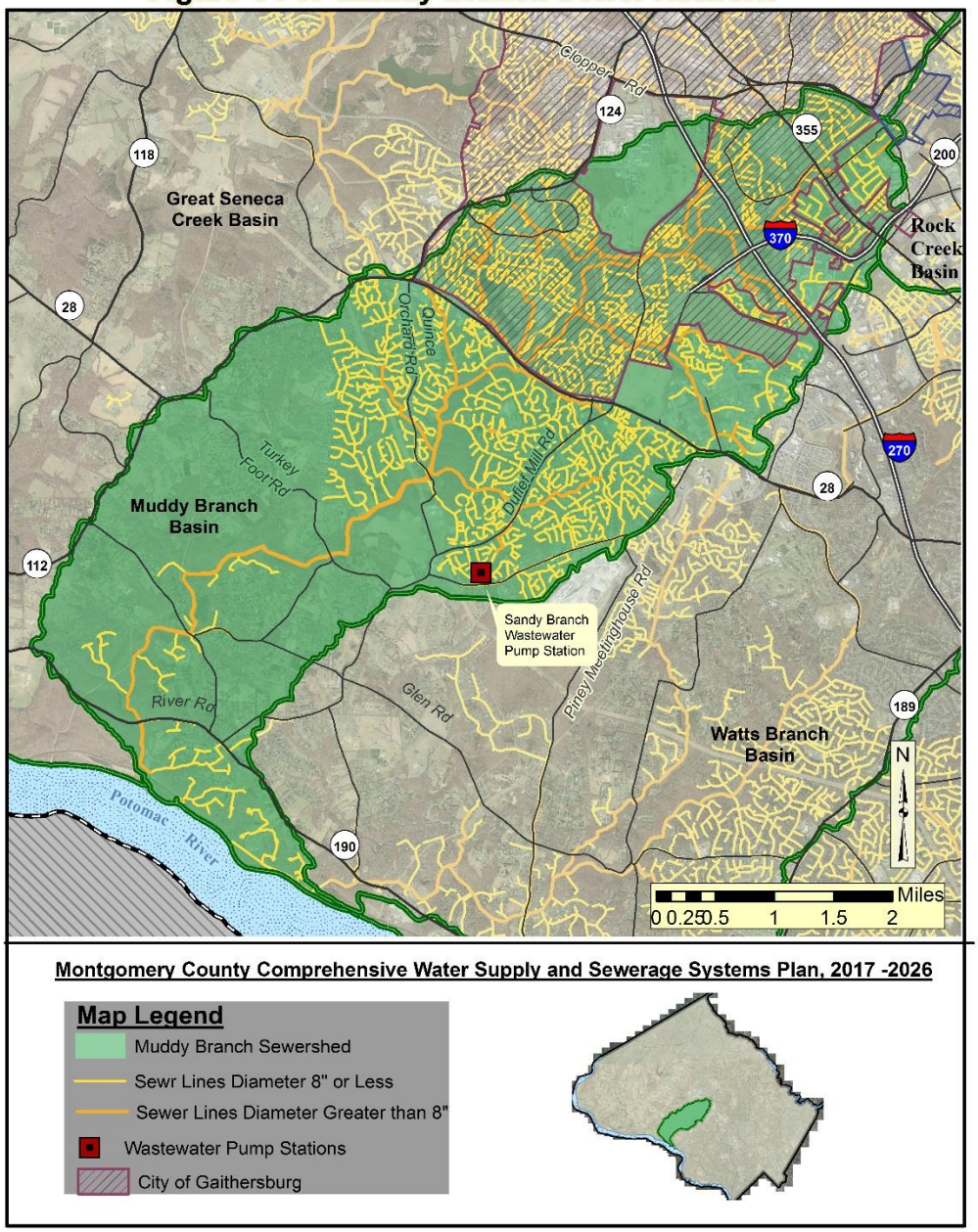
The following sections provide a general basin-by-basin description of existing and planned sewerage systems and projected needs for the sewersheds in Montgomery County served by the Potomac Interceptor.

I.C.1.A.i.a. Muddy Branch Basin:

The Muddy Branch basin originates in Gaithersburg in the central part of the County. The Muddy Branch stream flows generally southwest and enters the Potomac River near Pennyfield Lock. The upper part of the basin is developed with moderate to high-density residential, commercial and institutional uses. The lower half of the basin has significantly lower density, characterized by large-lot residential development which uses septic systems.

Existing Systems: Wastewater collection service is provided by a system of trunk sewers which extends up into the basin along the main stem of Muddy Branch. The Muddy Branch Basin boundary and the sewerage systems layout of the Muddy Branch sewer lines are shown in Figure 4-F9.

Figure 4-F9: Muddy Branch Sewer Network



Wastewater flows generated in Muddy Branch Basin are discharged into the Potomac Interceptor system and conveyed to the Blue Plains WWTP in the District of Columbia. WSSC currently maintains five permanent flow monitoring stations in this basin. The Muddy Branch basin also receives pumped flows from the Sandy Branch WWPS near Travilah Road. Based on current and future flows and other factors, WSSC regularly evaluates and categorizes all of its pump stations to allow for proper planning to handle expected wastewater flows. The latest WSSC's evaluation conducted in 2015, the Sandy Branch Pump Station was classified under category "C". Category "C" includes pump stations with the following conditions:

- Projected peak flows exceed the tested safe pumping capacity
- Projected peak flows can be pumped with all pumps operating and therefore do not produce an overflow
- A capacity-related overflow has not been reported
- Run time for the last pump may or may not be excessive

The current estimated flows and safe and maximum pumping Capacities for the Sandy Branch Pump Station are listed below.

Wastewater Pump Station	Average Dry Weather Flow (MGD)[1]	Estimated Peak Flow (MGD)[2]	Safe Capacity (MGD)[3]	Maximum Capacity (MGD)[3]
Sandy Branch	0.103	0.412	0.38	0.46

1- The average dry weather flows are estimated from pump station flow data (March 2015 to March 2016)
2- The estimated peak flows are based on the Maryland Peak Flow Curve
3- The Safe and Maximum capacities are based on pump tests conducted in 2015.

Projected Needs: Projected future (year 2025) flows based on forecasted population and other flow factors for the Muddy Branch Basin are summarized in Table 4-T5.

Table 4-T5: Future Wastewater Flows to the Potomac Interceptor from Muddy Branch Basin

Year		Average (MGD)	Peak (MGD)
2025	Projected Flow	7.30	24.6
	IMA Limitation	8.40	28.3
	Balance	+1.09	+3.72

Source: WSSC
Notes:
- 2025 projections are based on WSSC Sewer Model.

As noted herein before, the Muddy Branch sewer basin is identified as a Potential Overflow Basin and is currently undergoing work outlined in Article 6 of the Consent Decree. Since this work is not completed as of the update of this plan, as well as subsequent Performance Assessment as required in Article 7 of the Consent Decree, the impact of the improvements have yet to be determined. Therefore, in the interim, WSSC is utilizing its Standard Procedure, ENG 11-01 to evaluate the impact of new development on the system. These system evaluations utilize the base system conditions at the time of the WSSC's sewer model development and reevaluation as well as future system conditions.

Prior to beginning the work associated with the repairs, replacements, and rehabilitation, capacity constraints under 2025 wet weather conditions was identified in the following areas:

- 7,500 feet of trunk sewers along the main stem in Muddy Branch

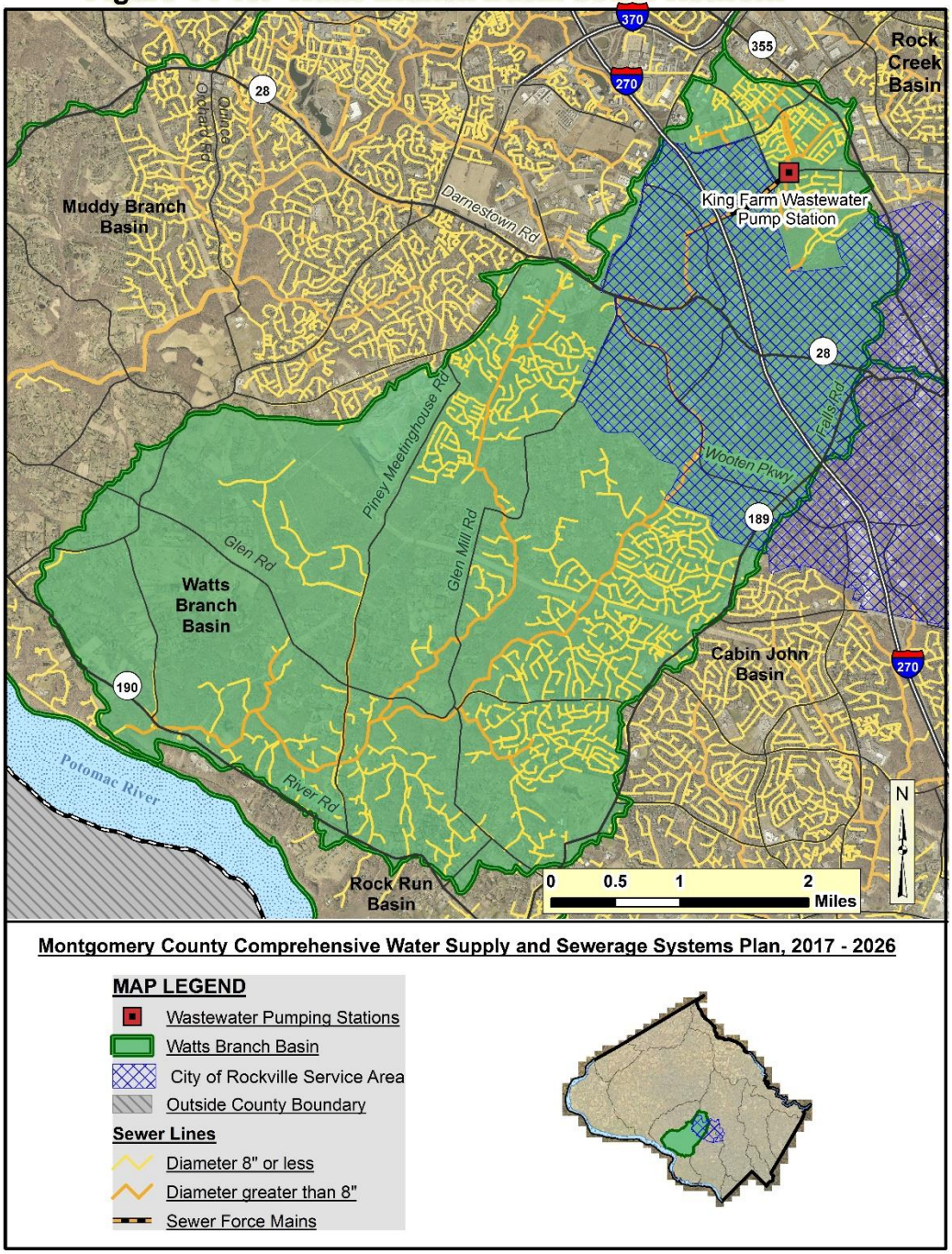
I.C.1.A.i.b. Watts Branch Basin:

The Watts Branch basin originates in Rockville in the central part of the County. The Watts Branch stream flows generally southwest through western Potomac and enters the Potomac River just west and upstream from the WSSC Potomac Water Filtration Plant.

Existing Systems -- Sewer service in Watts Branch Basin is presently provided by a trunk sewer system extending along Watts Branch which generally flows from northeast to southwest. The Watts Branch

Basin serves an area of 22.6 square miles and includes a portion of the City of Rockville. WSSC operates two permanent flow monitoring sites in the Watts Branch Basin: one at the point of connection with the City of Rockville system and one at the lower end of the basin where the trunk sewer connects with the PI. The sewerage system is shown in Figure 4-F10.

Figure 4-F10: Watts Branch Basin Sewer Network



Wastewater collected from the Watts Branch Basin is discharged to the PI and is treated at the Blue Plains Wastewater Treatment Plant. Discharges to the Potomac Interceptor are regulated through the Blue Plains IMA of 2012 and the 1966 Rockville-WSSC Agreement. The capacity of the Watts Branch trunk Sewer is divided between the City of Rockville and the WSSC by their 1966 agreement. The peak flow capacity of Rockville's component of the trunk sewer is approximately 8 MGD, which corresponds

to an average wastewater flow of 3 MGD. The trunk sewer's remaining capacity is allocated to flows collected from the WSSD.

The King Farm Wastewater Pumping Station is used to divert wastewater flows within Watts Branch. Based on current and future flows and other factors, WSSC regularly evaluates and categorizes all of its pump stations to allow for proper planning to handle expected wastewater flows. The latest WSSC's evaluation conducted in 2010, the King Farm Pump Station was classified under category "A". Category A includes pump stations with the following conditions:

- Projected peak flows are less than the tested safe pumping capacity
- The pump run time is less than 15 hours over the three year period
- Capacity related overflows do not occur.

The current estimated flows and safe and maximum pumping capacities for the King Farm Pump Station are listed below.

Wastewater Pump Station	Average Dry Weather Flow (MGD)[1]	Estimated Peak Flow (MGD)[2]	Safe Capacity (MGD)[3]	Maximum Capacity (MGD)[3]
King Farm	**0.624**	**2.16**	**4.88**	**6.78**

1: The average dry weather flows are estimated from pump station flow data (March 2015 to March 2016)
2: The estimated peak flows are based on the Maryland Peak Flow Curve
3: The Safe and Maximum capacities are based on pump tests conducted in 2015.

Projected Needs -- Projected future (year 2025) flows and related IMA limits for the Watts Branch Basin are summarized in Table 4-T6. The WSSC Planning Group has generated this information through their Sewer Basin Model.

Even though the current and projected annual average flows from the Watts Branch basin are slightly above the IMA limits, this is not a major concern. Flows into the PI from the Muddy Branch basin, upstream from Watts Branch, have been significantly reduced due to the diversion of flows to the expanded Seneca WWTP which were previously routed through the Muddy Branch sewerage system to the PI. Based on the previously conducted studies by the WSSC indicate that the basin's conveyance facilities will be able to handle the basin's anticipated wastewater flows through the year 2025. Based on ultimate flow projections, the entire Watts Branch trunk sewer from Rockville-WSSD boundary downstream to the PI will require relief sometime beyond the year 2025. Future wastewater capacity constraints will be affected by the timing and type of development occurring on some of the major development sites within the sewershed.

Table 4-T6: Future Wastewater Flows to the Potomac Interceptor from Watts Branch Basin

Year		Average (MGD)	Peak (MGD)
2025	Projected Flow	4.75	16.45
	IMA Limitation	5.80	16.50
	Balance	**+1.05***	**+0.05***

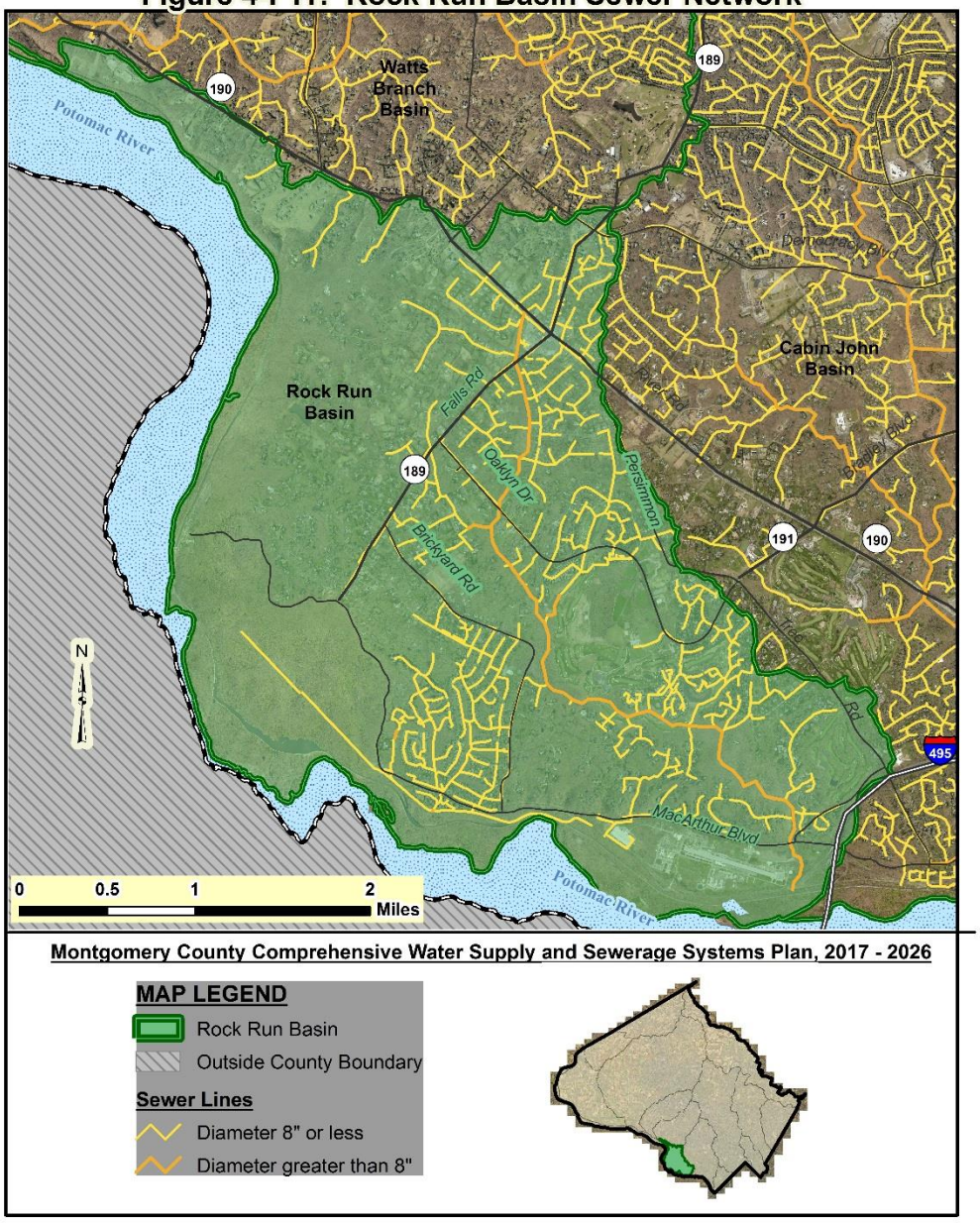
Source: WSSC
Notes: - 2025 projections are based on WSSC Sewer Model.
- Data include flows from the City of Rockville.
* Flows in excess of IMA Limits are off-set by underutilization of the PI upstream at Muddy Branch.

I.C.1.A.i.c. Rock Run Basin:

The Rock Run basin is located in the southern part of the County. For the purposes of this Plan, the basin includes areas served by sewerage systems which feed directly to the PI, rather than through the Rock Run Trunk Sewer. Rock Run originates in Potomac Village and flows southeast into the Potomac River near Carderock. Development within the basin is largely residential, with higher densities dependent on community sewer service generally east of Falls Road (Route 189).

Existing Systems - Wastewater collected within the Rock Run Basin is discharged by gravity into the PI system and conveyed to the Blue Plains WWTP in the District of Columbia. The Rock Run Basin is a relatively small basin, with predominantly moderate to low density zoning. The wastewater collection and conveyance facilities within the Rock Run Basin are adequate; there are no planned wastewater collection/conveyance projects, or proposed system modifications. The Rock Run Basin boundary and its major sewer lines are shown in Figure 4-F11.

Figure 4-F11: Rock Run Basin Sewer Network



Projected Needs – Projected future (year 2025) flows based on forecasted population and other flow factors and related IMA limits for the Rock Run Basin are summarized in Table 4-T7.

Table 4-T7: Future Wastewater Flows to the Potomac Interceptor from Rock Run Basin

Year		Average (MGD)	Peak (MGD)
2025	Projected Flow	1.086	5.64
	IMA Limitation	1.30	5.60
	Balance	+0.214	-0.04

Source: WSSC
Notes: - 2025 projections are based on WSSC Sewer Model.

As noted herein before, the Rock Run sewer basin is identified as a Adequate Capacity Basin under current and future conditions. The Rock Run is also currently undergoing work outlined in Article 6 of the Consent Decree. Since this work is not completed as of the update of this plan, as well as subsequent Performance Assessment as required in Article 7 of the Consent Decree, the impact of the improvements have yet to be determined. Therefore, in the interim, WSSC is utilizing its Standard Procedure, ENG 11-01 to evaluate the impact of new development on the system. These system evaluations utilize the base system conditions at the time of the WSSC's sewer model development and reevaluation as well as future system conditions.

Prior to beginning the work associated with the repairs, replacements, and rehabilitation to satisfy 2025 conditions, capacity constraints were identified in the following areas under wet weather conditions:

- 5,495 feet along the main stem of Rock Run Branch Trunk Sewer

I.C.1.A.ii. Maryland-Upper Potomac Interceptor:

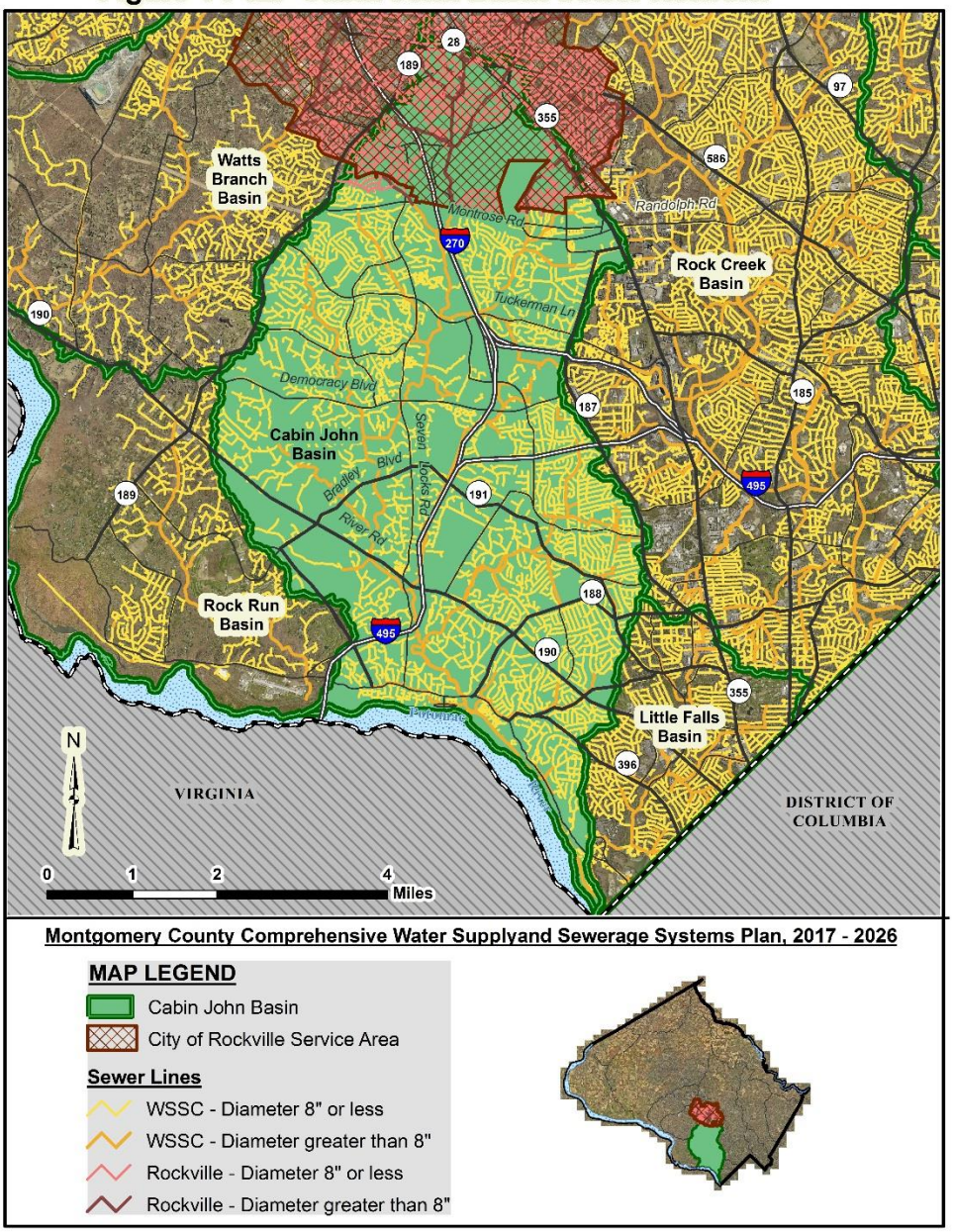
The Maryland-Upper Potomac Interceptor (MUPI) receives wastewater from the Cabin John basin, including parts of the City of Rockville, and from several mini-sewer basins within the Cabin John area along the Potomac River. The MUPI has a maximum capacity of 18.7 MGD. A 30-inch sewer line connects the MUPI to the PI just downstream from where wastewater from Cabin John Trunk Sewer discharges to the MUPI. When flow from the Cabin John Basin reaches the MUPI's maximum capacity, an automatic valve diverts the excess flow to the Potomac Interceptor. Both the MUPI and the PI drain into the Upper Potomac Interceptor (UPI) and Upper Potomac Interceptor Relief Sewer (UPIRS) in the District of Columbia.

I.C.1.A.ii.a. Cabin John Basin:

The Cabin John basin encompasses the entire 33 square mile drainage area of Cabin John Creek and includes portions of the Bethesda, Cabin John, Glen Echo, and Potomac communities, and portions of the City of Rockville. The stream originates in Rockville and flows south into the Potomac River near the Interstate 495 American Legion Bridge in Cabin John.

Existing Systems -- Service within the basin is presently provided by a system of trunk sewers reaching up along Cabin John Creek, which runs generally from north to south, crossing Montrose Road, Democracy Boulevard, Interstate 495, and River Road. Major trunk sewer lines in this basin include the Buck Branch Trunk, the Minnehaha Branch Trunk, Booze Creek Trunk, and the Snakeden Branch Trunk. The sewerage system and basin boundaries are shown in Figure 4-F12.

Figure 4-F12: Cabin John Basin Sewer Network



Collected wastewater flows by gravity down the basin's sewer mains into the MUPI, then flows into the Upper Potomac Interceptor Relief Sewer in the District of Columbia, and is treated at the Blue Plains WWTP. Wastewater flows from this basin to the MUPI and the PI systems are regulated through the 2012 Blue Plains IMA. The WSSC's allocated capacity from this basin to MUPI is divided between the City of Rockville and the WSSC as specified in the Rockville-WSSC Agreement of 1956.

The Cabin John basin is heavily to moderately developed. The total annual average and peak flows allocated to the Cabin John basin in the MUPI-PI crossover system equals 16.4 MGD and 60.3 MGD respectively.

The wastewater collection and conveyance facilities within the Cabin John basin are currently inadequate and a planned wastewater collection/conveyance projects or proposed system modifications will be along a stretch of the Cabin John Trunk Sewer just north of Interstate 495, near

River Road. As of the date of this Plan, development interests with property upstream of the areas with constraints have begun discussing with WSSC system improvements required to overcome these constraints in accordance with WSSC Policy ENG SP 11-01.

Projected Needs -- Projected future (year 2025) flows based on latest forecasted population and other flow factors for the Cabin John Basin are summarized in Table 4-T10. This table presents projected flows from the Cabin John Basin to the MUPI-PI crossover system and the IMA limitations. As can be seen, the projected annual average flows from this basin will exceed the IMA limits. This should not be a major concern since flows into the PI from the Muddy Branch basin, upstream from the Cabin John sewershed, are significantly reduced due to the diversion of flows to the expanded Seneca WWTP. Flows from the Seneca sewerage systems were previously routed through the Muddy Branch sewerage system to the PI.

Table 4-T8: Future Wastewater Flows to the Maryland-Upper Potomac Interceptor (MUPI) and the Potomac Interceptor (PI) from the Cabin John Basin

Year			Cabin John Basin Flows			
			Average (MGD)		Peak (MGD)	
2025	Projected Flow		14.30		57.90	
	IMA Limitation	MUPI	10.3	16.40	23.3	60.30
		PI	6.1		37	
	Balance		+2.10		+2.40	

Source: WSSC
Notes: 2025 projections are based on WSSC Sewer Model. Data include flows from the City of Rockville

As noted herein before, the Cabin John sewer basin is identified as a Potential Overflow Basin and is currently undergoing work outlined in Article 6 of the Consent Decree. Since this work is not completed as of the update of this plan, as well as subsequent Performance Assessment as required in Article 7 of the Consent Decree, the impact of the improvements have yet to be determined. Therefore, in the interim, WSSC is utilizing its Standard Procedure, ENG 11-01 to evaluate the impact of new development on the system. These system evaluations utilize the base system conditions at the time of the WSSC's sewer model development and reevaluation as well as future system conditions.

Prior to beginning the work associated with the repairs, replacements, and rehabilitation, relief/augmentation to satisfy 2025 conditions was identified in the following areas:

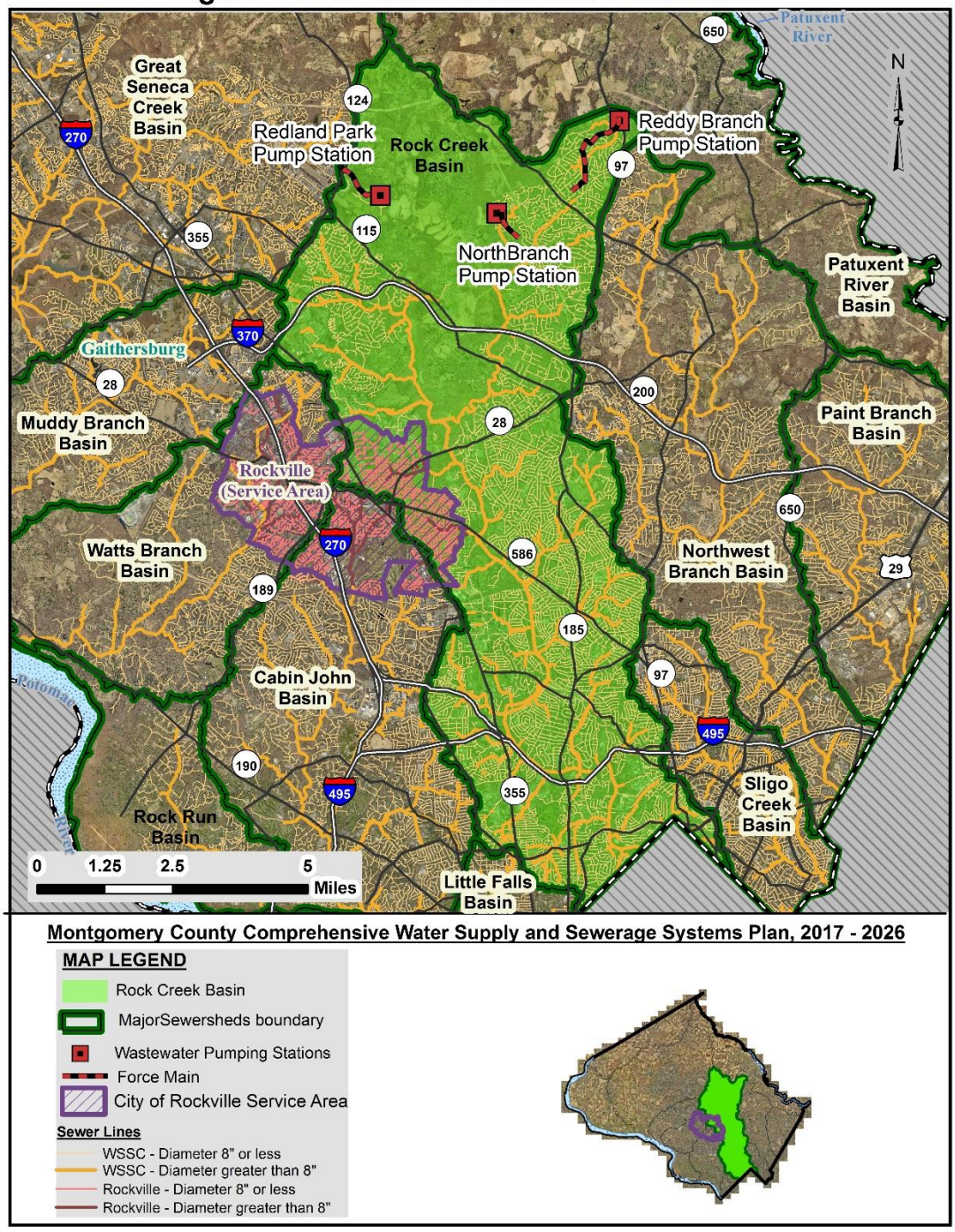
- 3,300 feet of relief sewer along Cabin John Creek near River Road and the Capital Beltway (this relief sewer will be constructed in relation to an upstream development project as described previously).

I.C.1.A.iii. Rock Creek Basin:

The Rock Creek basin is located in the southern and central parts of the County. The headwaters of Rock Creek originate in largely rural areas between Olney and Laytonsville. The stream flows generally south and enters the District of Columbia near Chevy Chase. The basin boundaries are roughly defined on the west by the Old Georgetown Road/Rockville Pike corridor and on the east by Georgia Avenue, and include portions of the following planning areas: Bethesda-Chevy Chase, Silver Spring, North Bethesda-Garrett Park, Kensington-Wheaton, Rockville, Aspen Hill, Olney, Gaithersburg, and the Upper Rock Creek Watershed. Rock Creek is the most intensely developed sewer basin in Montgomery County.

Existing Systems -- The Rock Creek Trunk Sewers consist of two parallel gravity interceptor sewers which carry the accumulated wastewater from of the Montgomery County's portion of the Rock Creek Basin south into the District of Columbia and to the Upper Potomac Interceptor Relief Sewer and ultimately treated at the Blue Plains WWTP. The Rock Creek Basin boundary and the major sewer lines layout in this basin are shown in Figure 4-F13.

Figure 4-F13: Rock Creek Sewer Network



Substantial amount of the County's current and anticipated development depends on the sewerage infrastructure in the Rock Creek Basin. The basin receives flows from much of the development and

redevelopment planned for the Bethesda, Grosvenor, Nicholson, Rockville, and Shady Grove areas in the west and the Silver Spring, Wheaton, and Olney areas in the east.

The limited wastewater transmission capacity in the Rock Creek Trunk Sewers at the point where they enter the District of Columbia has been a major constraint in meeting the wastewater conveyance needs in the Rock Creek Basin since the early 1980s. The 2012 IMA limits the peak flow from Montgomery County through the Rock Creek Basin to the Blue Plains WWTP at 56.6 MGD. The IMA also limits the trunk sewers' annual average flow to 33.5 MGD.

In 1983, the "Rock Creek Transmission Relief Facility Plan" provided for relief of existing surcharging and overflows in the Rock Creek sewers. This study recommended the construction of the Rock Creek Storage Facility, which WSSC built in 1991 just south of Randolph Road. This facility offloads and stores excess peak flows from the trunk sewers; the stored wastewater is gradually returned to the trunk sewers during times of lower flow. The storage facility provides flexibility in meeting the IMA peak flow limit of 56.6 MGD. It has been determined by WSSC that the Rock Creek Storage Facility provides an additional 24 MGD to the IMA peak flow limit of 56.6 MGD (1994 WSSC Strategic Sewer Study).

In addition to the pump station at the Rock Creek Storage Facility, there are three other operating pump stations in this basin and include Reddy Branch, North Branch, and Redland Park pump stations.

A portion of the wastewater generated in the Olney area in the Hawlings River (Patuxent River) Watershed is pumped into the Rock Creek Basin through the Reddy Branch WWPS, located just east of Brookeville. The North Branch Pump Station pumps flows from development located north of Bowie Mill Road into a gravity sewer main at Cashell Road, conveying those flows to the North Branch Trunk Sewer. This pump around was constructed to avoid extending the North Branch Trunk Sewer upstream through environmentally sensitive park land.

Based on current and future flows and other factors, WSSC regularly evaluates and categorizes all of its pump stations to allow for proper planning to handle expected wastewater flows. The latest WSSC's evaluation conducted in 2015, the Reddy Branch Pump Station has been classified under category "D". Category "D" includes pump stations with estimated peak flows exceeding the tested safe and maximum capacities. Both the North Branch and Redland pump stations have been classified under category "A". Category A includes pump stations with the following conditions:

- Projected peak flows are less than the tested safe pumping capacity
- The pump run time is less than 15 hours over the three year period
- Capacity related overflows do not occur.

The current estimated flows and safe and maximum pumping capacities for the three pump stations in Rock Creek Basin are listed below.

Wastewater Pump Station	Average Dry Weather Flow (MGD)[1]	Estimated Peak Flow (MGD)[2]	Safe Capacity (MGD)[3]	Maximum Capacity (MGD)[3]
Rock Creek Storage Facility	0.00	0.00	24	24
Reddy Branch	0.393	1.469	1.63	2.32
North Branch	0.192	0.768	1.05	1.62

1: The average dry weather flows are estimated from pump station flow data (March 2015 to March 2016)
2: The estimated peak flows are based on the Maryland Peak Flow Curve
3: The Safe and Maximum capacities are based pump tests conducted in 2015.

Projected Needs – Table 4-T9 summarizes projected flows from the Rock Creek Basin, based on latest forecasted population and other flow factors, and the related IMA limitations at the District of Columbia line.

Table 4-T9: Future Wastewater Flows to the Rock Creek Trunk Sewer

Year		Average (MGD)	Peak (MGD)
2025	Projected Flow	29.8	58.9
	IMA Limitation	33.5	56.6 (+24)
	Balance	+3.73	+21.7

Source: WSSC
Notes: - 2025 projections are based on WSSC Sewer Model.
- WSSC has assumed that the Rock Creek Storage Facility (WSSC Strategic Sewerage Study of 1994) provides an additional 24 MGD to the IMA peak flow limit of 56.6 MGD.
- Data include flows from the City of Rockville

As noted herein before, the Rock Creek sewer basin is identified as a Potential Overflow Basin and is currently undergoing work outlined in Article 6 of the Consent Decree. Since this work is not completed as of the update of this plan, as well as subsequent Performance Assessment as required in Article 7 of the Consent Decree, the impact of the improvements have yet to be determined. Therefore, in the interim, WSSC is utilizing its Standard Procedure, ENG 11-01 to evaluate the impact of new development on the system. These system evaluations utilize the base system conditions at the time of the WSSC's sewer model development and reevaluation as well as future system conditions.

Prior to beginning the work associated with the repairs, replacements, and rehabilitation, capacity constraints under 2025 conditions were identified in the following areas:

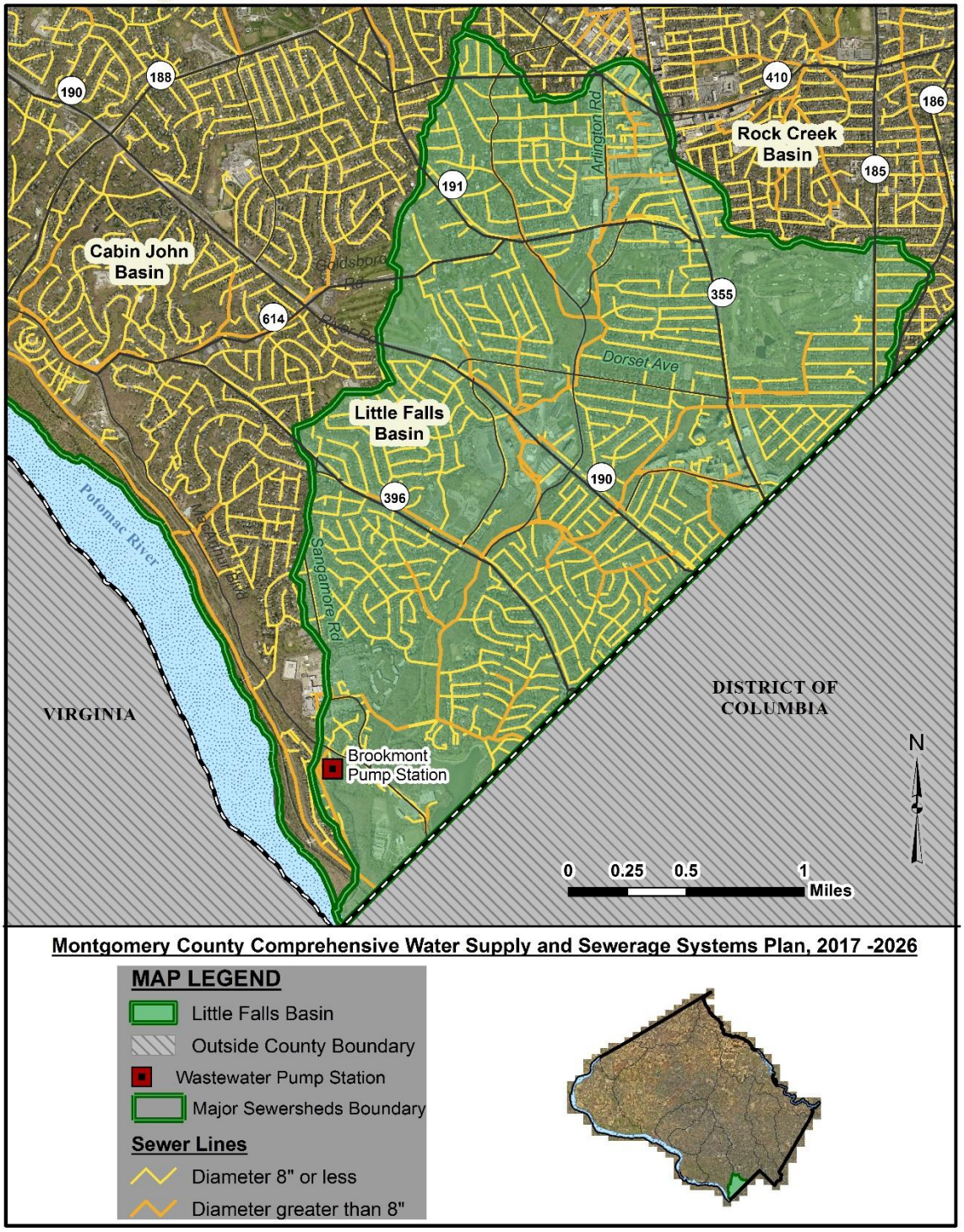
- Reddy Branch near the Reddy Branch Wastewater Pumping Station;
- A tributary of Mill Creek Branch, south of Midcounty Highway;
- Rock Creek Branch

I.C.1.A.iv. Little Falls Sewerage System:

The Little Falls Basin is relatively small and substantially developed. The basin encompasses the southern portions of the communities of Bethesda and Chevy Chase, near the District of Columbia.

Existing Systems -- The Little Falls Trunk Sewer receives wastewater from the Little Falls basin and conveys it into the Upper Potomac Interceptor Relief Sewer (UPRIS) in the District of Columbia, where these flows are treated at the Blue Plains WWTP. Flows from the Little Falls Trunk Sewer into the UPRIS are regulated by the 2012 Blue Plains IMA. Figure 4-F14 shows the Little Falls Basin boundary and its major sewer lines.

Figure 4-F14: Little Falls Basin Sewer Network



Sewerage service is presently provided by a system of trunk sewer lines reaching up into the basin along Little Falls Branch, with a major extension north of Massachusetts Avenue along Willett Branch. The wastewater collection and conveyance facilities within the Little Falls Basin are adequate and there are no planned wastewater collection/conveyance projects or proposed system modifications.

The Brookmont Pumping Station is used to divert wastewater flows into Little Falls Basin. Based on current and future flows and other factors, WSSC regularly evaluates and categorizes all of its pump stations to allow for proper planning to handle expected wastewater flows. The latest WSSC's evaluation conducted in 2015, the Brookmont Pump Station was classified under category "A". Category A includes pump stations with the following conditions:

- Projected peak flows are less than the tested safe pumping capacity
- The pump run time is less than 15 hours over the three year period
- Capacity related overflows do not occur.

The current estimated flows and safe and maximum pumping capacities for the King Farm Pump Station are listed below.

Wastewater Pump Station	Average Dry Weather Flow (MGD)[1]	Estimated Peak Flow (MGD)[2]	Safe Capacity (MGD)[3]	Maximum Capacity (MGD)[3]
Brookmont	**0.003**	**0.012**	**0.06**	**0.15**

1: The average dry weather flows are estimated from pump station flow data (March 2015 to March 2016)
2: The estimated peak flows are based on the Maryland Peak Flow Curve
3: The Safe and Maximum capacities are based on pump tests conducted in 2015

Projected Needs – Table 4-T10 summarizes projected flows, based on latest forecasted population and other flow factors, and IMA flow restrictions for the Little Falls Basin.

Table 4-T10: Future Wastewater Flows from Little Falls Basin

Year		Average (MGD)	Peak (MGD
2025	Projected Flow	4.90	19.4
	IMA Limitation	7.60	20.8
	Balance	+2.70	+1.40

Source: WSSC
Notes: - 2025 projections are based on WSSC Sewer Model.

As indicated in the preceding table, WSSC does not expect the annual average and peak flows from thee Little Falls Basin to exceed the IMA limitations. Based on the latest WSSC wastewater flow, it has been determined that the Little Falls trunk sewer has adequate capacity to receive the projected wastewater flows through 2025.

As noted herein before, the Little Falls sewer basin is identified as an Adequate Capacity Basin and is currently undergoing work outlined in Article 6 of the Consent Decree. Since this work is not completed as of the update of this plan, as well as subsequent Performance Assessment as required in Article 7 of the Consent Decree, the impact of the improvements have yet to be determined. Therefore, in the interim, WSSC is utilizing its Standard Procedure, ENG 11-01 to evaluate the impact of new development on the system. These system evaluations utilize the base system conditions at the time of the WSSC's sewer model development and reevaluation as well as future system conditions.

I.C.1.A.v. Anacostia Interceptor System:

This sewerage system originated in the 1930's and is one of the oldest within the WSSD. Sewer service is presently provided to more than 80 percent of the Anacostia River Basin in Montgomery County, encompassing an area of about 39 square miles, and including communities in the following planning areas: Fairland - Beltsville, Colesville - White Oak, Cloverly - Norwood, Kemp Mill - Four Corners, Takoma Park, Silver Spring, Kensington - Wheaton, Aspen Hill, and Olney. Nearly all of the sewered portion of Eastern Montgomery County is situated within the upper reaches of the Anacostia River Basin. The Paint Branch sewer basin includes the watersheds of both Paint Branch and Little Paint Branch.

Existing Systems – The Anacostia Interceptor System receives wastewater from both Prince George's and Montgomery Counties. The wastewater collection system consists of a network of trunk sewers reaching up along Sligo Creek, and Long, Northwest, Little Northwest, Buckhorn, Hollywood, Paint, and Little Paint Branches. The wastewater flows by gravity down the basin through Prince George's County to the Anacostia Pumping Station near the District of Columbia adjacent to the Anacostia River. From there, the wastewater is pumped through a force main to a gravity sewer parallel to the Anacostia River, then on to the Blue Plains WWTP for treatment. WSSC's use of the tributaries to Anacostia Interceptor System is governed by both the 2012 IMA and the Bi-County Agreement.

Major sub-basins served by the Anacostia Interceptor System in Montgomery County include Paint Branch, Northwest Branch, and Sligo Creek. A brief description of the sewerage systems in each of these three sub-basins follows.

I.C.1.A.v.a. Sligo Creek Basin --The Sligo Creek Basin is relatively small and substantially developed, covering an area from downtown Wheaton south to downtown Silver Spring. The trunk sewer parallels Sligo Creek and enters the Prince George's County east of the Silver Spring commercial center. The boundaries of this basin is shown in Figure 4-F15.

The Arcola Pumping Station is the only wastewater pumping station used to divert wastewater flows into the Sligo Creek from the adjacent Northwest Branch Basin. Based on current and future flows and other factors, WSSC regularly evaluates and categorizes all of its pump stations to allow for proper planning to handle expected wastewater flows. The latest WSSC's evaluation conducted in 2010, the Arcola Pump Station was classified under category "A". Category A includes pump stations with the following conditions:

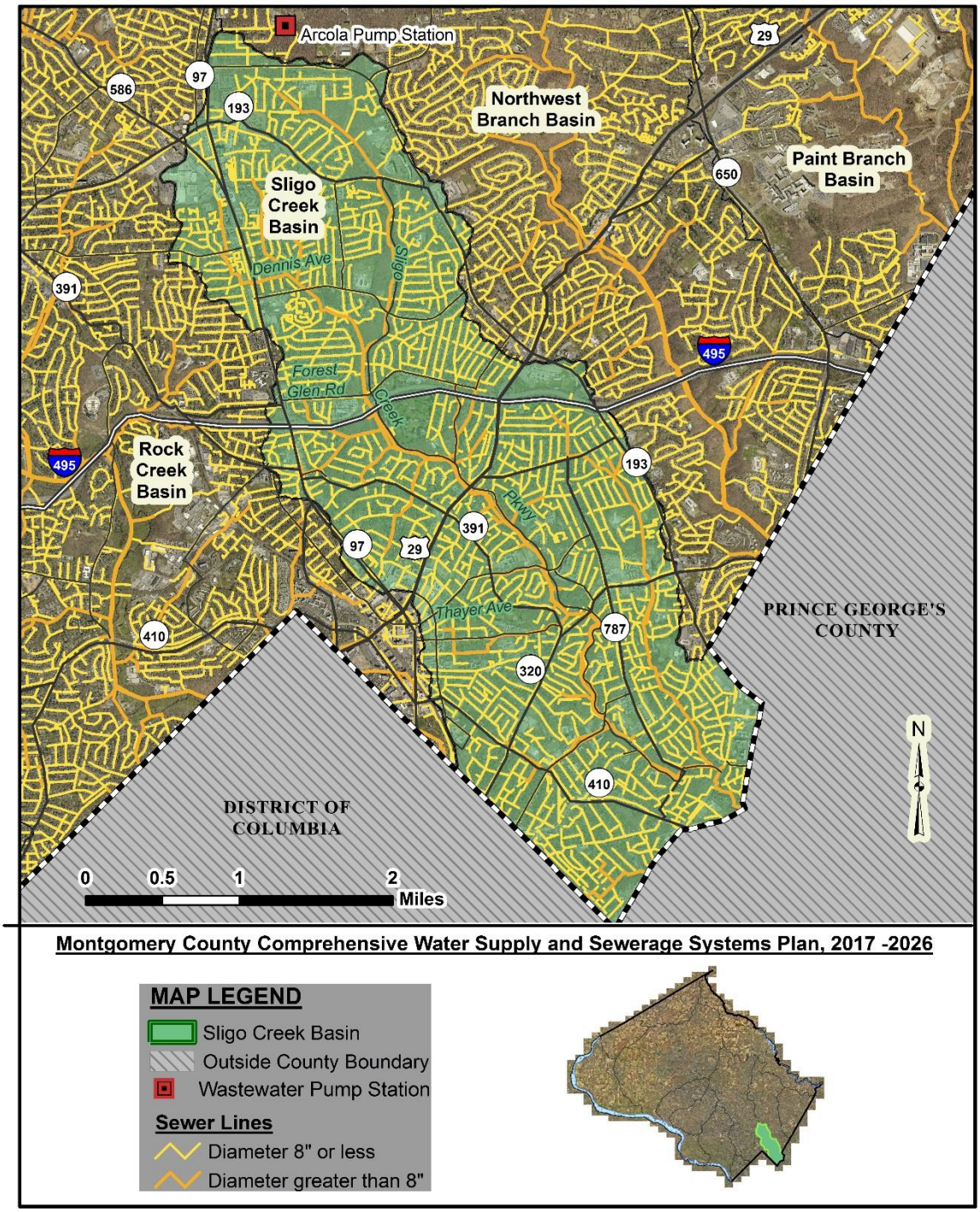
- Projected peak flows are less than the tested safe pumping capacity
- The pump run time is less than 15 hours over the three year period
- Capacity related overflows do not occur.

The current estimated flows and safe and maximum pumping capacities for the Arcola Pump Station are listed below.

Wastewater Pump Station	Average Dry Weather Flow (MGD)[1]	Estimated Peak Flow (MGD)[2]	Safe Capacity (MGD)[3]	Maximum Capacity (MGD)[3]
Arcola	**0.014**	**0.056**	**0.17**	**0.22**

1: The average dry weather flows are estimated from pump station flow data (March 2015 to March 2016)
2: The estimated peak flows are based on the Maryland Peak Flow Curve
3: The Safe and Maximum capacities are based on pump tests conducted in 2015.

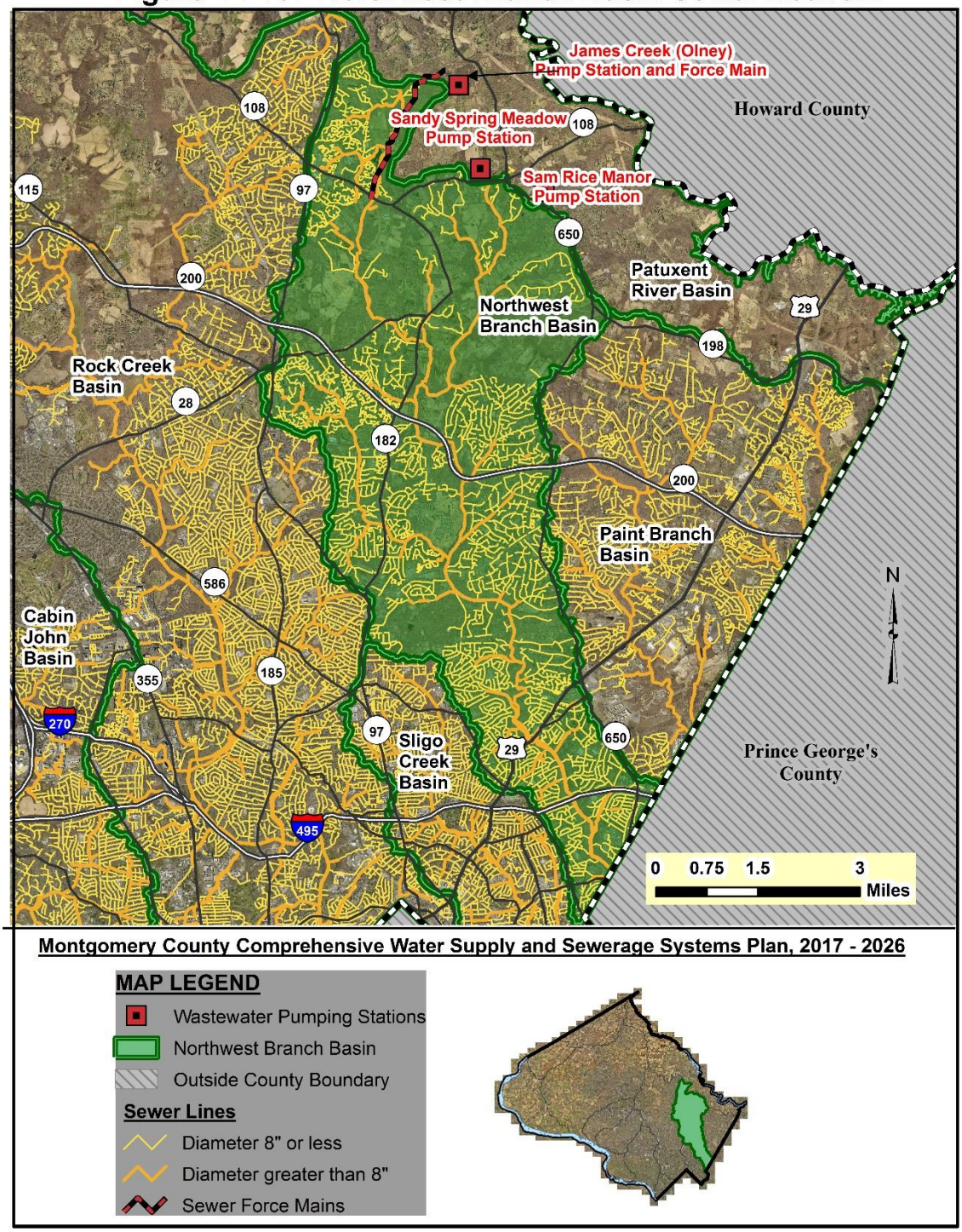
Figure 4-F15: Sligo Creek Basin Sewer Network



I.C.1.A.v.b. Northwest Branch Basin -- The Northwest basin is situated in the eastern parts of the County between Rock Creek Basin on the West and the Paint Branch Basin on the East. The Basin includes good portions of Cloverly/Norwood (PA28) and Colesville/White Oaks (PA 33) Panning Areas and the eastern boundaries of this basin are roughly defined on the New Hampshire Avenue/MD 650. The headwaters of the Northwest Branch, a tributary to Anacostia River, originate in the upper parts of

the basin and flows in southeasterly direction into the Prince Georg's County. The Northwest Branch Basin is shown in Figure 4-F16.

Figure 4-F16: Northwest Branch Basin Sewer Network



In addition to the wastewater generated within the Northwest Branch watershed, the sewer system in this basin also receives wastewater flows pumped from other adjacent watersheds through three pumping stations. In the Olney Planning Area, the James Creek (Olney) WWPS pumps flows from the Hawlings River Watershed (from the area generally north of Route 108 and east of Georgia Avenue). In the Cloverly - Norwood Planning Area, flows are pumped from the Hawlings River Watershed (north of Route 108) through the Sandy Spring Meadows WWPS; flows are also pumped from the Patuxent River Watershed (northeast of New Hampshire Avenue) through the Sam Rice Manor WWPS.

Based on current and future flows and other factors, WSSC regularly evaluates and categorizes all of its pump stations to allow for proper planning to handle expected wastewater flows. The latest WSSC's evaluation conducted in 2015, all three wastewater pumping stations diverting flow into the Northwest Branch Basin have been classified under category "A". Category A includes pump stations with the following conditions:

- Projected peak flows are less than the tested safe pumping capacity
- The pump run time is less than 15 hours over the three year period
- Capacity related overflows do not occur.

The current estimated flows and safe and maximum pumping capacities for all four pump stations in Rock Creek Basin are listed below.

Wastewater Pump Station	Average Dry Weather Flow (MGD)[1]	Estimated Peak Flow (MGD)[2]	Safe Capacity (MGD)[3]	Maximum Capacity (MGD)[3]
James Creek (Olney)	**0.745**	**2.504**	**4.75**	**5.23**
Sandy Spring Meadows	**0.008**	**0.032**	**0.11**	**0.15**
Sam Rice Manor	**0.017**	**0.068**	**0.11**	**0.11**

1: The average dry weather flows are estimated from pump station flow data (March 2015 to March 2016)
2: The estimated peak flows are based on the Maryland Peak Flow Curve
3: The Safe and Maximum capacities are based on pump tests conducted in 2015.

I.C.1.A.v.c. Paint Branch Basin -- The Paint Branch Trunk Sewer traverses much of the southeastern part of the Montgomery County. Trunk sewers parallel Paint Branch and its major tributaries, including Little Paint Branch. The Paint Branch Trunk Sewer enters Prince George's County in the White Oak area. The Paint Branch sewer basin is shown in Figure 4-F17.

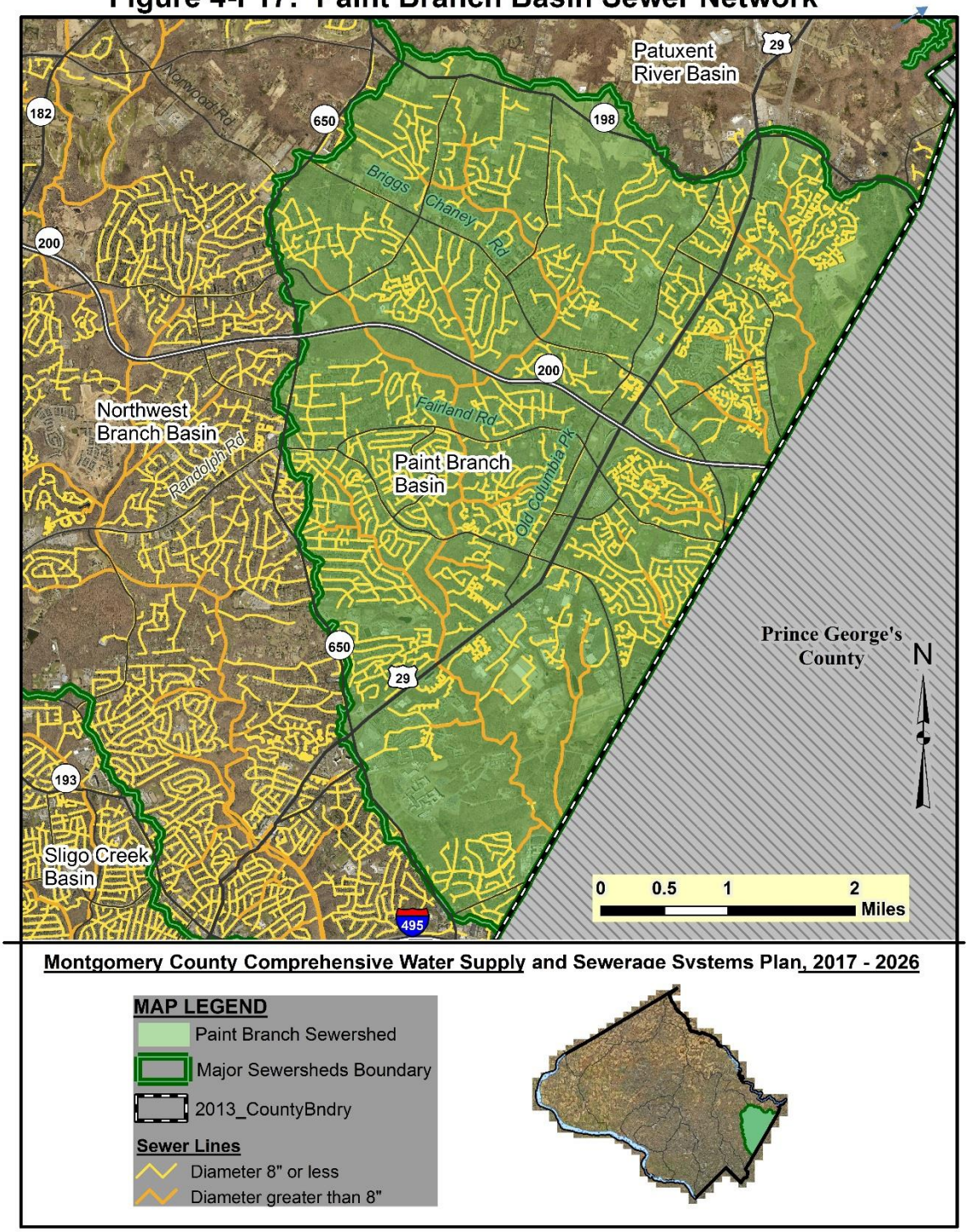
Projected Needs -- The available sewer capacity in the Anacostia Interceptor System service area is shared between Prince George's and Montgomery Counties on a first come-first served basis as specified in the Bi-County Capacity Agreement. Projected annual average and peak flows in this basin, which includes flows from both counties, are compared to the IMA limitation in Table 4-T11.

Table 4-T11: Future Wastewater Flows from Anacostia River Basin

Year		Average (MGD)	Peak (MGD)
2025	Projected Flow	64.7	185.00
	IMA Limitation	83.20	185
	Balance	+18.5	0.00

Source: WSSC
Notes: - 2025 projections are based on WSSC Sewer Model.

Figure 4-F17: Paint Branch Basin Sewer Network



As indicated in the preceding table, the combined projected annual average flows from both Montgomery and Prince George's Counties in the Anacostia Interceptor system will not exceed the IMA limitation before 2025. WSSC's peak flow which is pumped into the DC system from the WSSC Anacostia Pumping Station in Prince George's County is constrained to a maximum of 185 MGD due to pressure limitations on the Anacostia Force Main within DC. The recently completed Anacostia

Storage facility (on the pumping station site) helps attenuate peak flows in order to keep them below the 185 MGD limit.

WSSC is utilizing its Standard Procedure, ENG 11-01 to evaluate the impact of new development on this basin system. These system evaluations utilize the base system conditions at the time of the WSSC's sewer model development and reevaluation as well as future system conditions.

Sligo Creek Basin -- Much of the development potential in Sligo Creek is limited to redevelopment of existing commercial areas, such as the downtown areas of Silver Spring and Wheaton. Although, the basin is identified as a Potential Overflow Basin, WSSC does not anticipate future sewage capacity constraints or overflows within Montgomery County.

Northwest Branch Basin – This basin is currently identified as a Potential Overflow Basin. A small length of gravity sewer (about 200 feet) is identified as having capacity constraints under projected future wet weather conditions. Currently, there are no planned CIP projects in this basin.

The Northwest Branch Basin is currently undergoing work outlined in Article 6 of the Consent Decree. Since this work is not completed as of the update of this plan, as well as subsequent Performance Assessment as required in Article 7 of the Consent Decree, the impact of the improvements have yet to be determined.

Paint Branch Basin -- Major sewer lines tributary to Anacostia Interceptor System in this basin have adequate capacity at present, and there are no planned CIP projects in this basin. However, considerable growth is expected to occur in this area along the U.S. Route 29 corridor.

WSSC has determined through its sewer modeling that that 17,000 feet of sewer in the Paint Branch basin within Montgomery County will have capacity constraints under projected future wet weather flow conditions. As noted herein before, the Paint Branch sewer basin is identified as a Potential Overflow Basin and is currently undergoing work outlined in Article 6 of the Consent Decree. Since this work is not completed as of the update of this plan, as well as subsequent Performance Assessment as required in Article 7 of the Consent Decree, the impact of the improvements have yet to be determined

Anacostia Storage Facility:

Anacostia Storage Facility was constructed in June 2013 near the Anacostia No. 2 Wastewater Pump Station (WWPS) and has volume of 7 million gallons (MG). The facility was designed to store wastewater flows from the Anacostia interceptor systems in excess of 199 mgd limit, usually during significant wet weather events, to DC Water's wastewater system. The storage facility includes five storage cells. Weirs and sluice gates control the wastewater flow between cells. The facility is designed to use the head in the storage tank to drain a portion of wastewater flow through the force main to minimize re-pumping. A 48-inch influent line diverts the flow from and drains to the Anacostia No.2 WWPS 72-inch (east) force main from Cell 1 of the storage facility. A 30-inch effluent line east of the facility drains the remaining wastewater from the storage tanks to a 66-inch gravity sewer which redirects the flows to the wet well to be re-pumped. Valves on the influent and effluent lines control the flow to and from the storage facility.

I.C.1.B. Blue Plains Service Area Treatment Facility:

All the wastewater generated in the Blue Plains Service Area is treated at the Blue Plains Wastewater Treatment Plant (WWTP) located in Washington D.C. The District of Columbia Water and Sewer Authority (DC WATER) owns, operates, maintains, and is responsible for the design and construction of all projects at the plant.

The Blue Plains WWTP has been the primary wastewater treatment facility for the Washington Metropolitan Area since its original construction in 1938. The facility has been improved and expanded over the years to provide better quality effluent and to increase capacity for population growth in the plant's service area. The principal jurisdictions using the Blue Plains facilities include: The District of Columbia; portions of Arlington, Fairfax and Loudoun Counties in Virginia; and most of Montgomery and Prince George's Counties in Maryland. The utilities serving these jurisdictions pay their proportionate share of capital and operating costs based on their treatment capacity allocation and actual flow to the plant. The use of this treatment plant is governed by the Blue Plains Intermunicipal Agreement (IMA) of 2012.

The Blue Plains WWTP receives approximately 80% of the wastewater generated in Montgomery County. As shown in Figure 4-F6, this service area encompasses much of the central and eastern part of the County which includes Muddy Branch, Rock Creek, Watts Branch, Cabin John Creek, Rock Run, Little Falls Branch, Northwest Branch, Paint Branch, and Sligo Creek Basins.

The current total annual average allocated capacity at the Blue Plains WWTP is 370 MGD, the design capacity of this plant. Table 4-T12 summarizes the actual flows received at Blue Plains during 2014 from each jurisdiction.

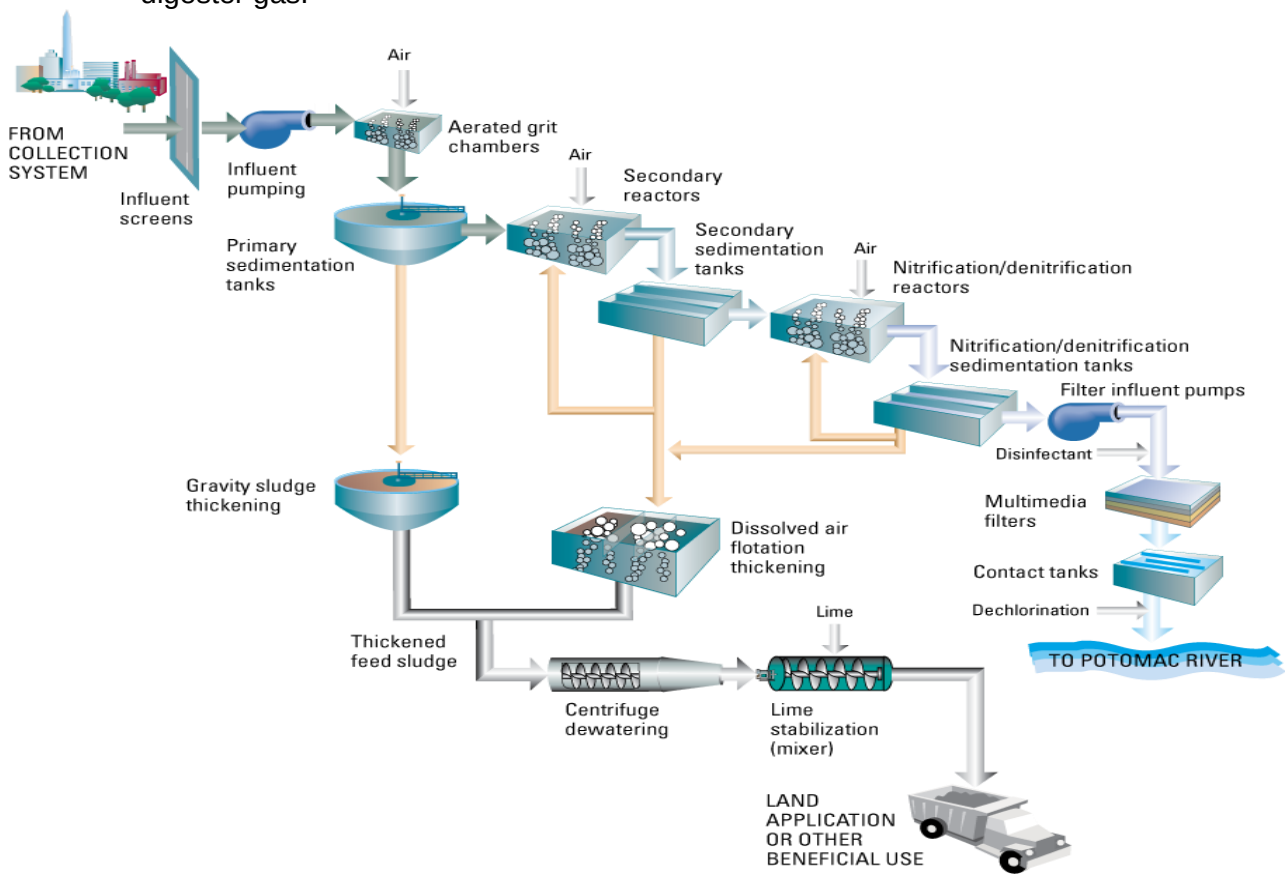
Table 4-T12: 2015 Actual Daily Average Wastewater Flows to the Blue Plains WWTP and IMA Limitations

2014	Total Flows to Blue Plains (MGD)	District of Columbia Flows (MGD)	WSSC Flows (MGD)	All Other Jurisdiction Flows (MGD)
January	298.8	128.0	128.6	42.190
February	274.9	113.8	120.3	40.804
March	333.4	140.8	145.7	46.982
April	308.7	128.8	136.5	43.351
May	285.2	121.6	122.3	41.320
June	332.9	157.4	131.3	44.292
July	305.1	135.1	127.9	42.123
August	262.7	114.5	108.7	39.489
September	256.7	115.3	103.0	38.392
October	268.9	122.1	107.4	39.318
November	263.5	119.1	105.8	38.556
December	282.6	126.2	115.3	41.070
Annual Daily Average	**289.453**	**126.898**	**121.064**	**41.491**
IMA Limitation	**370.0**	**152.5**	**169.6**	**47.9**

Source: WSSC
Notes: 1- WSSC use of allocated flow capacity is limited to 163.6 MGD due to diversion of nitrogen and phosphorus load allocations (loads associated with 6 MGD) to the WSSC's Seneca Wastewater Treatment Plant.
2- The Allocated Flow Capacity of 47.9 MGD for other jurisdiction include wastewater from Fairfax and Loudoun counties, Dulles Airport, Town of Vienna, and other small users.

The unit processes employed at the Blue Plains WWTP includes the followings and are shown schematically below.

- **Primary Treatment:** Screening, grit removal, primary clarification with metal salt addition for phosphorus removal
- **Secondary Treatment:** Activated sludge, addition of metal salts for phosphorus removal and secondary clarification
- **Advanced Treatment:** Nitrification with chemical addition, final clarification and filtration, denitrification
- **Disinfection:** Chlorination with sodium hypochlorite
- **Dechlorination:** Sulfur Dioxide
- **Solids Conditioning:** Centrifuge and belt filter dewatering
- **Solids Handling:** Land application by outside contractors and incineration at Fairfax County. Also, recent additions to Solids Handling include;
    - Thermal Hydrolysis – the first application in the U.S., and largest in the world;
    - Anaerobic Digestion – resulting in a 50% reduction and improvement to Class A of residual biosolids; and;
    - Combustion Turbines – generating 30% of the WWTP's electric power needs from the digester gas.



A summary of capital projects planned and currently underway to upgrade and expand the wastewater treatment plants serving the County and/or to address facility maintenance needs are listed in the current CIP budget document and are available through WSSC's budget webpage at:

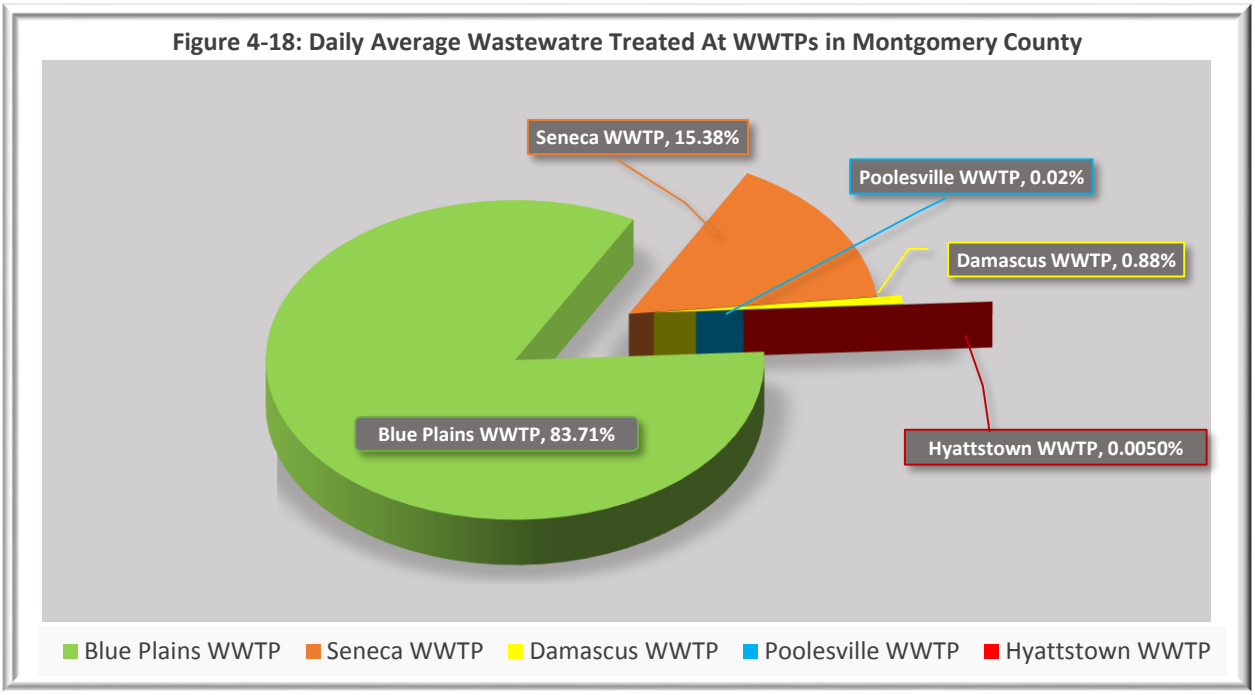
https://www.wsscwater.com/budget.

Based on data from all five publicly-owned wastewater treatment plants serving Montgomery County, as presented in Table 4-T13, the daily average of wastewater generated in Montgomery County during 2015 was approximately 100 MGD. As shown in Figure 4-F18, the Blue Plains WWTP receives approximately 84 percent of all community-system wastewater generated in Montgomery County.

Table 4-T13: Wastewater Generated in Montgomery County in 2015*

Service Area	Treatment Facility	Daily Average Flow Treated ()
Blue Plains	Blue Plains WWTP	88.85
Seneca	Seneca WWTP	10.5
Damascus	Damascus WWTP	0.0055
Hyattstown	Hyattstown WWTP	0.000031
Poolesville	Poolesville WWTP	0.000107
TOTAL		**99.36**

* Community systems only.



I.C.1.B.i. Blue Plains Service Area Projected Wastewater Treatment Needs:

Projected flows based on forecasted population and other flow factors for Blue Plains service area are summarized in Table 4-T14. This data, produced by WSSC, is based on COG's Round 8.1 Cooperative demographic forecasts and WSSC's latest wastewater flow factors. As shown in this table, the County's

projected wastewater treatment needs within the Blue Plains service area will be met well beyond the year 2025.

Table 4-T14: Projected Flows and Available Treatment Capacity in the Blue Plains Service Area

Sewer Basin	Projected Average Flows (mgd)[1]					
	2015	2020	2025	2030	2035	2040
Anacostia [2]	60.9	62.9	64.7	66.3	67.7	68.9
Cabin John [3]	13.7	14.0	14.3	14.5	14.7	15.0
Little Falls	4.70	4.81	4.88	4.95	5.02	5.06
Muddy Branch	6.34	6.74	7.31	7.94	8.23	8.51
Rock Creek [3]	27.8	29.0	29.8	30.7	31.4	32.1
Rock Run	1.08	1.09	1.09	1.09	1.09	1.09
Watts Branch [3]	4.46	4.58	4.75	4.90	5.01	5.05
Other Prince George's County Flows [4]	7.19	7.25	7.34	7.57	7.72	7.86
TOTAL [5]	**126.2**	**130.4**	**134.1**	**138.0**	**140.8**	**143.5**
Blue Plains WWTP	**WSSC Allocated Treatment Capacity (mgd)**					
	169.6	**169.6**	**169.6**	**169.6**	**169.6**	**169.6**
	WSSC Available Treatment Capacity (mgd)					
	43.4	39.2	35.5	31.5	28.8	26.1

1 - Projected Average Flows based on WSSC sanitary sewer model and MWGOG Round 8.1 Demographic Projections
2 - Anacostia Flows include flows from Prince George's County
3 - Includes flows from the City of Rockville
4 - Includes flow from Oxon Run sewer basin
5 - Does not include flows from smaller basins directly connected to the Potomac Interceptor

Plan Recommendation: WSSC - IMA Allocated Flow Capacity and Related Nitrogen and Phosphorus Load Allocations

WSSC use of IMA allocated flow capacity of 169.6 MGD at the Blue Plains Wastewater Treatment Plant has been reduced to 163.6 MGD due to diversion of nitrogen and phosphorus load allocations (loads associated with 6 MGD) at the WSSC's Seneca Wastewater Treatment Plant. WSSC should initiate a process to explore the possibilities of restoring the full WSSC's allocated capacity in the Blue Plains Wastewater Treatment Plant.

I.C.2. Seneca WWTP Service Area:

The Seneca Service Area includes substantial portions of the Great Seneca Creek and Little Seneca Creek watersheds and serves the communities of Gaithersburg, Germantown and Clarksburg (see Figure 4-F19). The Great Seneca Creek watershed is the largest watershed in Montgomery County with a drainage area of approximately 128 square miles. A rolling, hilly topography is characteristic throughout this drainage basin and steep slopes are found along some of the principal stream valleys. The I-270 corridor is the major development corridor extending from Bethesda to Clarksburg. For the most part, the areas within the watershed outside the I-270 corridor are low density residential and agricultural land uses, and are largely served by individual, on-site septic systems.

Until 2003, most of the wastewater generated in Seneca Basin was conveyed to the Blue Plains WWTP for treatment via a pumpover to the Muddy Branch sewerage system and was technically considered as part of the Blue Plains Service Area. The expansion of the Seneca WWTP from 5.0 MGD to 20.0 MGD provided for the treatment of all the wastewater generated in this basin and the transfer of flows to Blue Plains WWTP was discontinued. The facility design for Seneca WWTP expanded capacity to 26.0 MGD. This was enabled by a transfer of 6 MGD of nitrogen and phosphorus load allocation from WSSC's allocation at the Blue Plains WWTP.

The removal of Seneca flows from the Blue Plains service area provided many benefits for the sewerage systems in Montgomery County and the Washington Suburban Sanitary District (WSSD). These benefits include:

- Minimizing the length of new and relief sewers required, with associated environmental and community benefits.
- Alleviating capacity constraints in the Muddy Branch sewer system.
- Relieving capacity and flow limitations in the Potomac Interceptor.

II.C.2.A. Collection and Conveyance Systems:

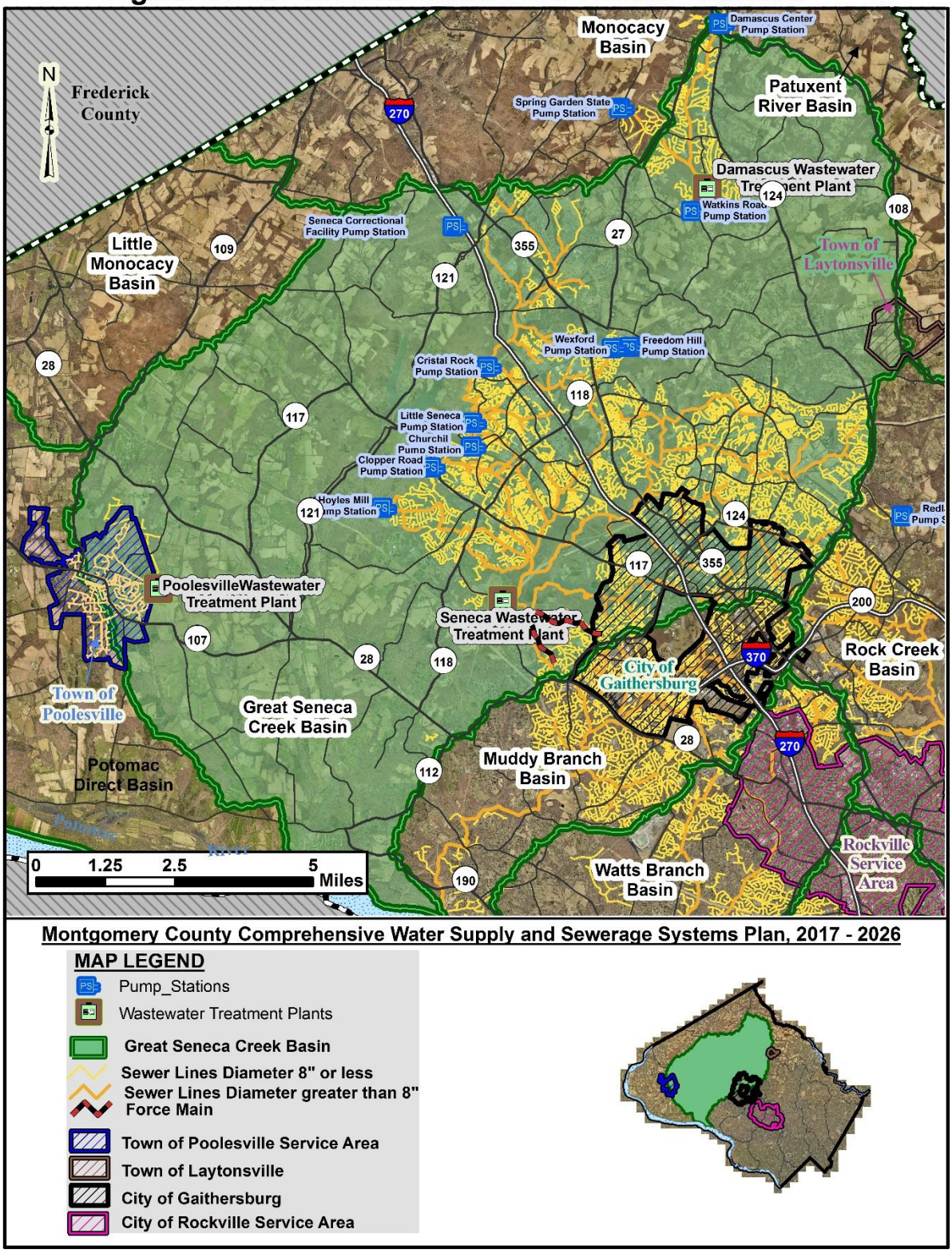
Approximately 25 percent of the Seneca Creek Basin is presently sewered. In accordance with adopted land use master plans, approximately 35 percent of the basin will ultimately be sewered. Sewerage service is presently provided by a system of trunk sewers which reaches up into the Basin along Great Seneca Creek and Long Draught, Whetstone, Cabin, and Gunners Branches. The Seneca Creek Basin boundary and the sewerage system layout in the Great Seneca portion of the Seneca Creek Basin are shown in Figure 4-F19.

Sewers also extend upstream from the Little Seneca Pumping Station along Little Seneca Creek. The Churchill Pumping Station also serves a portion of this basin. The Redland Park WWPS and Force Main pump flows from the Sheffield (Redland Park) subdivision, located in the upper part of the Rock Creek Watershed, into the Seneca Creek Basin near the County Airpark. The Redland Park Pump Station serves approximately 150 homes in the Redland Park Subdivision and Lindburgh Drive.

Based on current and future flows and other factors, WSSC regularly evaluates and categorizes all of its pump stations to allow for proper planning to handle expected wastewater flows. The latest WSSC's evaluation conducted in 2015, all the wastewater pumping stations except Little Seneca Pumping stations diverting flow into or out of the Seneca Service Area have been classified under category "A". Category A includes pump stations with the following conditions:

- Projected peak flows are less than the tested safe pumping capacity
- The pump run time is less than 15 hours over the three year period
- Capacity related overflows do not occur.

Figure 4-F19: Seneca Creek Basin Sewer Network



The Little Seneca has been classified under Category "B". The Crystal Rock pump station was constructed to divert flows from the Little Seneca pump station. However, flows at the Seneca pump station have not increased to make operation of the Crystal Rock pump station necessary as of this update. The Redland Park and Seneca Correctional Facility Wastewater Pumping Stations were

classified under Category "A-." This classification was earned because estimated peak flows are less than the safe capacity but all pumps were in operation for more than 30 hours total between 2009 and 2014. The current estimated flows and safe and maximum pumping capacities for all the pump stations in Seneca Service Area are listed below.

Wastewater Pump Station	Average Dry Weather Flow (MGD)[1]	Estimated Peak Flow (MGD)[2]	Safe Capacity (MGD)[3]	Maximum Capacity (MGD)[3]
Churchill	0.139	0.556	0.7	1.25
Clopper Road	0.332	1.277	2.00	3.25
Crystal Rock[4]	--	--	--	--
Freedom Hill	0.021	0.084	0.35	0.41
Hoyles Mill	0.197	0.788	1.80	2.58
Little Seneca	2.868	7.700	6.15	9.25
Redland Park	0.027	0.108	0.28	0.32
Seneca Correctional Center	0.055	0.22	0.80	0.90
Wexford	0.093	0.372	0.80	1.10

1: The average dry weather flows are estimated from pump station flow data (March 2015 to March 2016)
2: The estimated peak flows are based on the Maryland Peak Flow Curve
3: The Safe and Maximum capacities are based on pump tests conducted in 2015
4. The Crystal Rock Pump Station is constructed but not operational yet

The basin has been one of the most active basins in the County in providing new wastewater services during recent years. A summary of the Seneca Creek sewerage system projects approved by the County in the WSSC Capital Improvements Program (CIP) for the current fiscal year is provided in Appendix A; these projects address wastewater conveyance constraints/needs and improve service in the Seneca Creek Basin.

Projected flows based on forecasted population and other flow factors for the Seneca Creek Basin are summarized in Table 4-T15. These projections have been developed by the WSSC and are based on Round 8.1 Cooperative demographic forecasts.

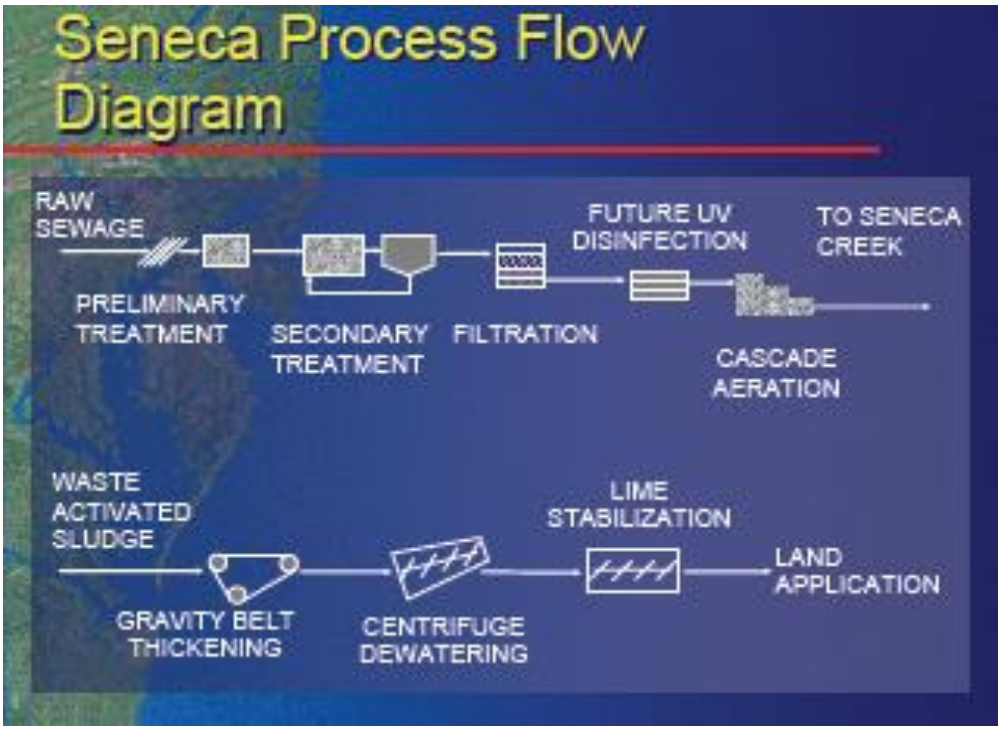
Table 4-T15: Future Wastewater Flows from the Seneca Creek Basin

Year	Annual Average Flow (MGD)	Peak Flow (MGD)
2015	16.8	40.5
2025	19.5	47.7

I.C.2.B. Seneca Treatment Facilities:
Since January 2015, the Seneca WWTP is now designed as an ENR (Enhanced Nutrient Removal) Facility with a 26 MGD ultimate capacity employing the following unit processes:

- Preliminary treatment: Course bar screening at the Influent Pumping Facility (IPF), and fine bar screening and grit removal at the Preliminary Treatment Facility (PTF)

- Advanced treatment: ENR (enhanced nutrient removal) utilizing the Bardenpho process with Methanol Addition (External Carbon) for Nitrification/De-Nitrification (5 basins). Phosphorus removal by chemical addition of Aluminum Sulfate (Alum).
- Final Clarification (4 clarifiers). Dual media (sand and gravel) gravity filtration (20 filters). Post aeration of final effluent
- Disinfection: Provided by Ultraviolet Light (UV) system (added in 2007 replacing chlorination/de-chlorination)
- Chemical Addition: Methanol for Nitrogen removal. Aluminum Sulfate for Phosphorus removal.
- Alkalinity adjustment and pH control if needed (acid and caustic addition)
- Solids Conditioning: Gravity Belt thickeners & centrifuge dewatering (both with polymer addition). Stabilization by mixing with Lime (Calcium Oxide).
- Solids Disposal: Land application by contractor of approximately 1700 wet tons per month average.



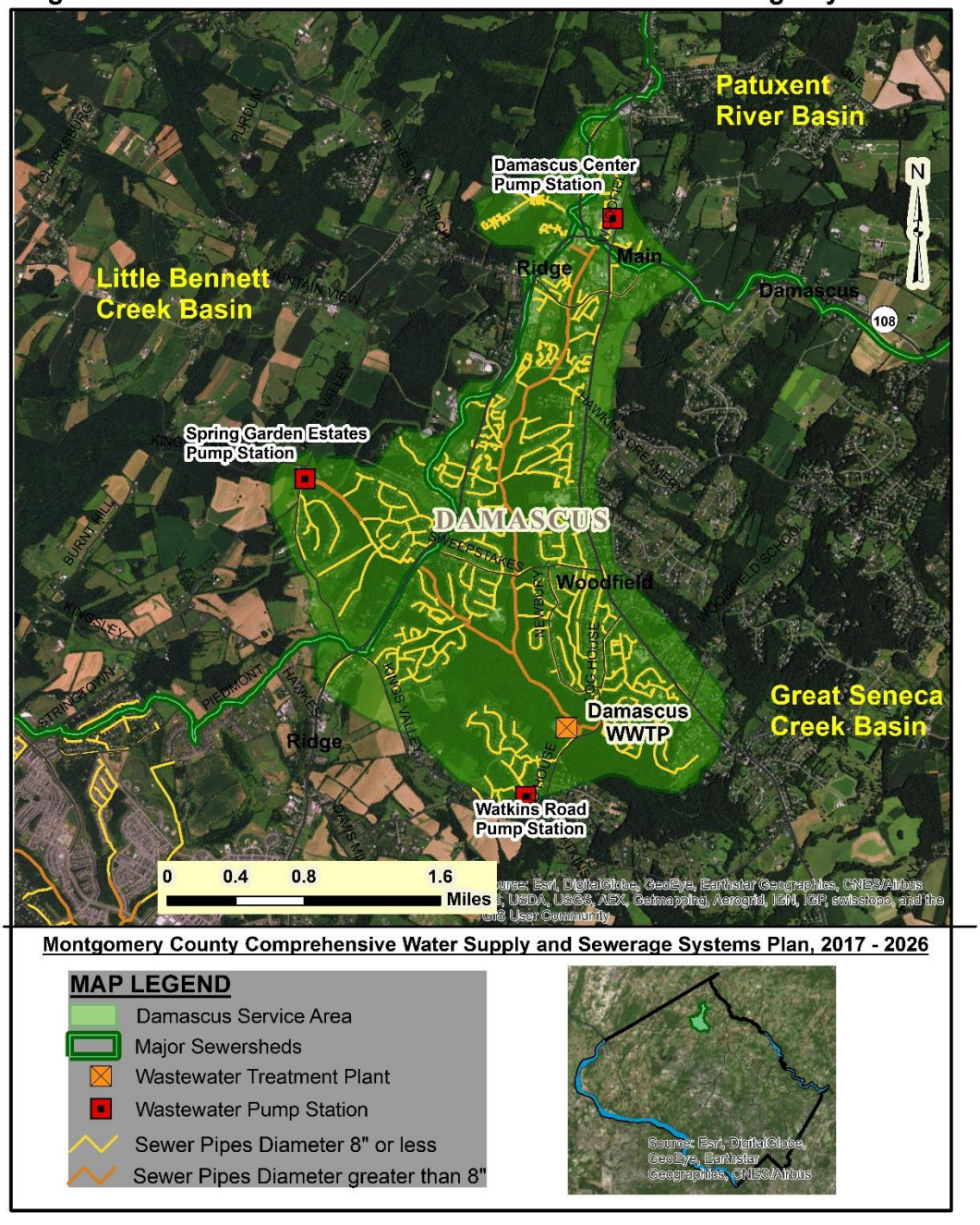
Plan Recommendation: Limit Pumpovers from Other Basins into Seneca to Preserve the Projected Treatment Capacity at the Seneca WWTP

Unlike some other major sewersheds in the County such as Rock Creek or Northwest Branch, the Seneca Creek Basin does not receive significant inflows of wastewater pumped in from other watersheds. In order to preserve projected treatment at the Seneca WWTP for proposed development within the basin, this plan proposes to continue this policy. However, small-scale pumpovers which do not significantly or cumulatively affect treatment capacity, such as the Redland Park project, may occur. This policy would be reevaluated as part of any future analysis of County's long-term wastewater treatment needs.

I.C.3. Damascus WWTP Service Area:

The Damascus Service Area is centered along the ridges of three major drainage basins in upper Montgomery County which include the headwaters portions of Seneca Creek, Patuxent River, and the Monocacy watersheds. Even though most of the Damascus Service Area is within the Seneca Creek Basin, it is not connected to the sewer network that drains into the Seneca WWTP system because of considerable distance between Damascus and Germantown. Most of the existing service area lies within the Magruder Branch Valley between Routes 27 and 124. The treatment plant and sewerage system are shown in Figure 4-F20.

Figure 4-F20: Damascus WWTP Service Area and Sewerage System



The Damascus sewerage system is owned and operated by the WSSC and therefore, sewerage system planning, financing, and other associated programs/policies in Damascus service area are generally identical to those of the Washington Suburban Sanitary District.

I.C.3.A. Damascus Collection and Conveyance Systems:

Much of the sewerage system in Damascus Service Area was constructed in early 1970's. The Magruder Branch Trunk Sewer transports wastewater from the collection system to the Damascus Wastewater Treatment Plant (WWTP). The trunk sewer follows Magruder Branch from near Main Street in the Damascus commercial center downstream to the Damascus WWTP influent pump station, located near Log House Road. The trunk sewer capacity varies along its length from 3.25 MGD to 18.24 MGD (Damascus Sewerage Facility Plan). The influent pumping station which conveys the collected wastewater into the treatment plant has a 5.0 MGD capacity (Little Seneca Creek Sewerage Facility Plan, 1982). These capacities are consistent with the peak flow needs of the system.

Three wastewater pumping stations convey flows from adjacent watersheds into the Damascus sewerage system or directly to the Damascus WWTP. The Spring Garden WWPS pumps sewage flows generated in the Little Bennett Creek watershed on the west side of Damascus. The Damascus Center WWPS pumps flows generated in the Patuxent River watershed to the north of the Damascus commercial area. The Watkins Road WWPS pumps flows generated in the Wildcat Branch sub-watershed of Great Seneca Creek to the Damascus WWTP. Based on current and future flows and other factors, WSSC regularly evaluates and categorizes all of its pump stations to allow for proper planning to handle expected wastewater flows. The latest WSSC's evaluation conducted in 2015, the Spring Gardens Estate pump station has been classified under category "D". Under this category, even though the simulated peak flow for the 2-year and 10-year storm design storm exceed the tested safe and maximum capacities, the peak flow estimated using the Maryland Peak Flow curve is less than the tested safe capacity and no overflows have been reported. The other two pump stations (Damascus Center and the Watkins Road pump stations) diverting flows to the Damascus sewerage systems have been classified under category "A". Category A includes pump stations with the following conditions:

- Projected peak flows are less than the tested safe pumping capacity
- The pump run time is less than 15 hours over the three year period
- Capacity related overflows do not occur.

The current estimated flows and safe and maximum pumping capacities for all the three pump stations are listed below.

Wastewater Pump Station	Average Dry Weather Flow (MGD)[1]	Estimated Peak Flow (MGD)[2]	Safe Capacity (MGD)[3]	Maximum Capacity (MGD)[3]
Damascus Center	0.024	0.096	0.29	0.41
Spring Gardens Estate	0.106	0.424	0.41	0.41
Watkins Road	0.020	0.080	0.14	0.20

1: The average dry weather flows are estimated from pump station flow data (March 2015 to March 2016)
2: The estimated peak flows are based on the Maryland Peak Flow Curve
3: The Safe and Maximum capacities are based on pump tests conducted in 2015.

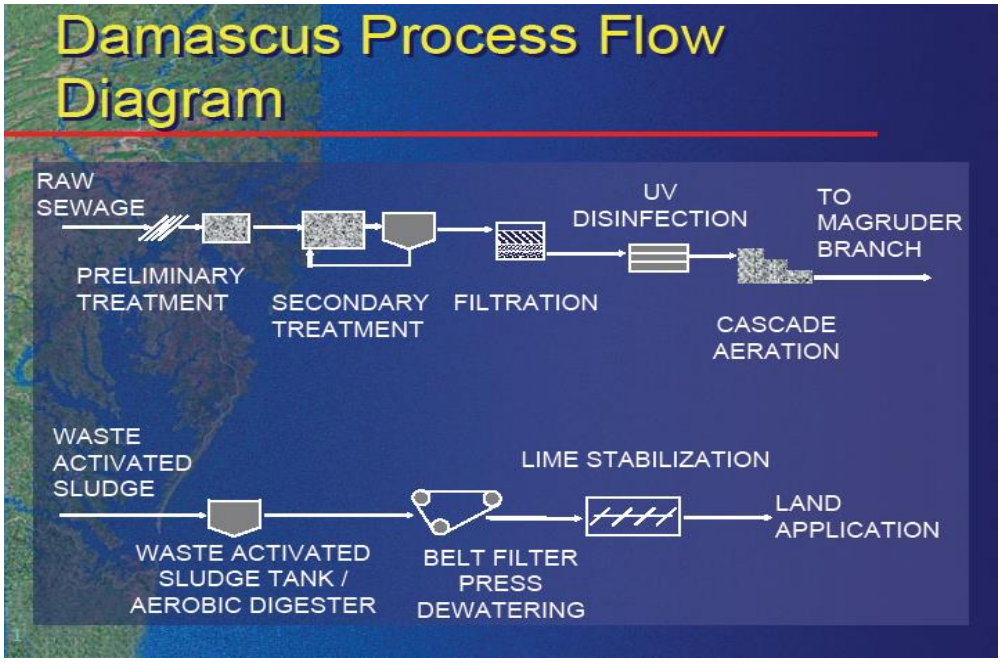
The Damascus service area is currently identified as an Adequate Capacity Basin. However, due to the capacity concerns with the Spring Gardens Estates Wastewater Pumping Station, the existing Spring Gardens Estates WWPS Wastewater Pumping Station is currently undergoing a Business Case study by WSSC to evaluate alternatives to relocate and replace the pump station and force main.Also, the Damascus Center WWPS is also currently undergoing a Business Case study by WSSC to evaluate alternatives to relocate and replace the existing pump station and force main that were acquired and modified by WSSC some years ago after original implementation as an on-site system for the Damascus Shopping Center. WSSC is also utilizing its Standard Procedure, ENG 11-01 to evaluate the impact of new development on the system. These system evaluations utilize the base system conditions at the time of the WSSC's sewer model development and reevaluation as well as future system conditions.

I.C.3.B. Damascus Treatment Facilities:

The Damascus WWTP is located approximately six miles upstream of the Great Seneca Creek Trunk Sewer. The original 0.75-MGD Damascus WWTP was built in 1974 as a temporary, secondary treatment plant to replace poorly functioning septic systems and allow new commercial and residential development in the area. In 1979 the plant was upgraded to include filtration and tertiary processes for the removal of phosphorus. In 1990, to provide additional treatment as Damascus grew and flow increased, the plant was re-rated by MDE to a 0.90 MGD facility.

To provide adequate treatment capacity for future growth, the "Damascus Area Facilities Plan" in 1989 identified the need for additional treatment capacity at the Damascus WWTP and recommended that the interim plant be replaced with a permanent facility with an expanded average daily flow of 1.5 MGD. The new 1.5 MGD plant, completed in 1999, provides treatment capacity for the Damascus Service Area. Since January 2014, Damascus WWTP is now designed as a 1.5 mgd capacity ENR (Enhanced Nutrient Removal) facility. The new plant employs the following treatment processes:

- Preliminary treatment: Channel grinders at the Influent Pumping Facility (IPF), and fine bar
- screening and grit removal at the Preliminary Treatment Facility (PTF)
- Secondary Treatment: Extended aeration (4 aeration basins), Bardenpho (MLE), Activated Sludge Process, and Secondary Clarification (2 clarifiers)
- Advanced treatment: ENR (enhanced nutrient removal) utilizing the Bardenpho process with external carbon addition for Nitrification/De-Nitrification (4 basins). Phosphorus removal by chemical addition of Aluminum Sulfate (Alum). Final Clarification (2 clarifiers). Dual media (sand and gravel) gravity filtration (4 filters). Post aeration of final effluent
- Disinfection: Ultraviolet Light (UV) system
- Chemical Addition: External Carbon for Nitrogen removal. Aluminum Sulfate for Phosphorus removal. Alkalinity adjustment and pH control if needed (acid and caustic addition)
- Solids Conditioning: Belt Filter Press dewatering (with polymer addition). Stabilization by mixing with Lime (Calcium Oxide).
- Solids Disposal: Land application by contractor of approximately 90 wet tons per month average



Sewage collection and treatment needs in the Damascus service area are provided based on anticipated development and land use patterns recommended in the Damascus Master Plan. WSSC evaluated long term (year 2010) wastewater collection and treatment needs in this service area in 1983 through the "Damascus Sewerage Study". The study concluded that the collection and conveyance systems in the Damascus service area have adequate capacity to handle the projected flows at least through the year 2010. In 1989, WSSC conducted the "Damascus Sewerage Facility Plan," estimating the projected 2010 annual average and peak wet weather wastewater flows for the Damascus service area to be approximately 1.50 MGD and 4.3 MGD, respectively. The findings were based on the existing flow factors and the M-NCPPC Intermediate Fall 1986 Population Forecast.

Projected flows based on demographic forecasts and other flow factors for the Damascus Service Area indicate that existing treatment facility will handle all expected wastewater flows from this service area for the foreseeable future.

I.C.4. Hyattstown WWTP Service Area:

The Hyattstown Service Area includes the Hyattstown Historic District, located along Frederick Road (Route 355) between Hyattstown Mill Road and Frederick County. The Hyattstown community consists of approximately fifty residential and commercial structures. In 1997, Montgomery County and WSSC agreed to build a community wastewater collection and treatment system to resolve chronic, long-term public health problems in Hyattsville resulting from failed septic systems. This sewerage system was primarily intended to be limited to the existing historic Hyattstown community, with an allowance for some growth within this area in conformance with the existing zoning and historic district designation. In 1998, the Montgomery County Council also approved community service for the Hyatt Center. Portions of this property, which abut the historic district, are located in both Montgomery and Frederick Counties, and the shopping center itself is located in Frederick County. The County Council approved sewer service for this site located outside Hyattstown historic district, due to the potential for this facility's septic systems to contaminate domestic wells in Hyattstown located downgrade from the shopping center. WSSC completed construction of the treatment plant in 1999.

I.C.4.A. Collection and Conveyance System:

The wastewater collection system uses a conventional gravity sewer line located primarily within the existing right-of-way of Frederick Road (Route 355) and consists of approximately 2,500 feet of 8-inch diameter PVC piping. This system will handle all expected wastewater flows from the Hyattstown community for the foreseeable future.

I.C.4.B. Treatment Facility:

The Hyattstown WWTP consists of a prefabricated, 15,000 gallons per day (gpd) package treatment plant with extended aeration that discharges treated effluent to Little Bennett Creek. The construction of the treatment facility was completed in 1998. The existing treatment facility will handle all expected wastewater flows from this sewerage system for the foreseeable future.

Hyattstown WWTP is a small packaged Secondary Treatment plant designed for 15,000 gallons per day and typically averages about 4,000 to 5,000 gallons per day. The new plant employs the following treatment processes:

- Preliminary treatment: Course bar screen and Basket Strainer before grinder pumps
- Secondary Treatment: Extended Aeration Activated Sludge Process (2 basins), with Secondary Clarification
- Disinfection: Ultraviolet Light (UV) system
- Solids Disposal: Liquid Solids stored on site, pumped out & transferred to Damascus WWTP for solids processing in 4,000 gallon loads about every other month.

II. ROCKVILLE SERVICE AREA:

The City of Rockville owns and operates an independent sewerage collection system within the corporate city limits. The City is responsible for planning, design, construction, and financing the sewage collection system. All of the city's flow is conveyed from the Rockville Service Area sewers through the WSSC's collector sewers and the DC Water's Potomac Interceptor (PI) to the Blue Plains AWWTP for treatment.

The City provides community sewerage service to an area located within the corporate limits of Rockville and outside the designated limits of the Washington Suburban Sanitary District (WSSD). Properties located with the City's maximum expansion limit (MEL) and outside the WSSD are eligible to receive sewer service from Rockville upon annexation into the corporate limits of Rockville. The City of Rockville provides sewer service to approximately 70% of Rockville. The remainder of Rockville is located within the WSSD and receive sewer service from WSSC. Properties that are within the Rockville's maximum expansion limits (MEL), but not in the WSSD, can receive sewer service from Rockville once they annex into the City.

II.A. Intergovernmental Agreements:

The City's use of WSSC's conveyance facilities has been defined by several transmission agreements. A 1956 agreement allows the City to discharge a peak flow of 6.8 MGD into the Cabin John Basin. The City has also purchased 8.0 MGD peak capacity for a portion of the Cabin John sewershed below Booze Creek. A 1966 agreement with WSSC allows for a maximum discharge of 8.0 MGD to the Watts Branch Basin. In 1975, the City and the WSSC executed an agreement specifying that WSSC would provide 9.31 MGD of WSSC's total treatment capacity at Blue Plains AWWTP. Rockville acknowledges that the City has not purchased sufficient peak capacity in all sewers to convey 9.31 MGD to the Blue Plains AWWTP. Furthermore, the 1975 agreement provides that the WSSC may rent treatment capacity at Blue Plains not needed by the City.

In addition to the overall City of Rockville and WSSC sewer flow agreements, DPW coordinates APFO/APFS review of water and sewer service with WSSC for private development projects in the City that are either within or near the boundary of the WSSD. This coordination provides for early identification of system improvements that will be needed to sustain long range planning goals of both WSSC and the City of Rockville.

II.B. Financing Sewerage Systems:

Information on the City's sewerage systems financing is included in Section IV.B of Chapter 1. Additional information on Capital Program for the City of Rockville is available at:
http://www.rockvillemd.gov/index.aspx?NID=1071

II.C. Collection and Conveyance Systems:

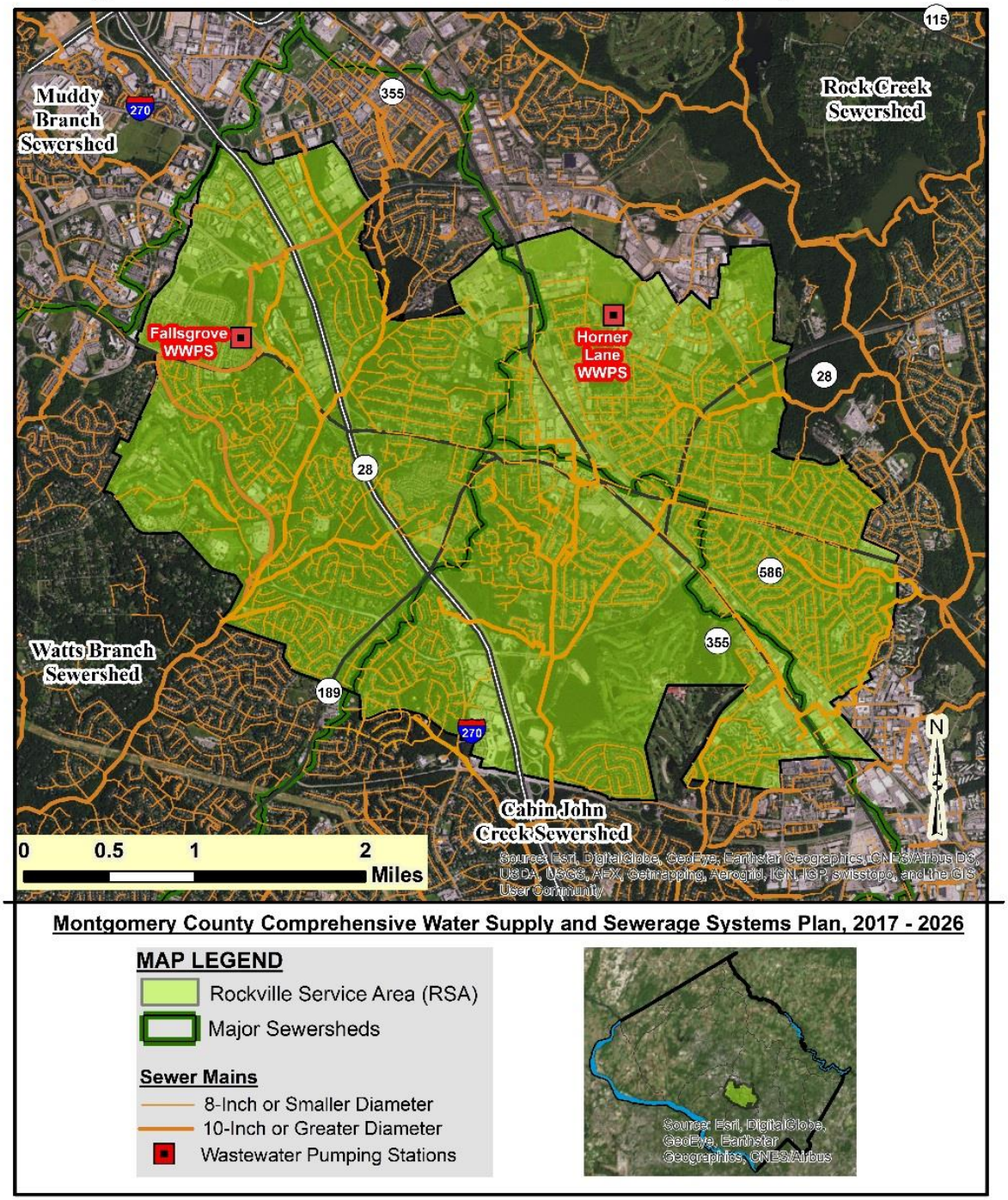
The City's flow collection system consists of approximately 148 miles of sewer mains in the Watts Branch, Cabin John and Rock Creek Basins (see Figure 4-F21). The City's system has a total of fourteen interconnections with the WSSC sewerage system. These include five WSSC inflows into the City's system and nine outfalls into WSSC's systems conveying flow to the Blue Plains Advanced Wastewater Treatment Plant in the District of Columbia. Six of these outfalls are major interconnections with WSSC, of which four of these major outfalls are metered.

The City has two wastewater pumping stations. One is located at the corner of Frederick Avenue and North Horners Lane. The second is located in the Fallsgrove community on Route 28.

Wastewater Pump Station	Average Dry Weather Flow (MGD)[1]	Estimated Peak Flow (MGD)[2]	Safe Capacity (MGD)[3]	Maximum Capacity (MGD)[3]
North Horner Lane	**0.033**	**0.132**		
Fallsgrove	**0.434**	**1.737**		

1: The average dry weather flows are based on estimated flow using flow factors from 110 properties with a mix of residential and light industrial uses for the North Horners WWPS and from 591 properties with a mix of residential, office, and retail uses for the Fallsgrove WWPS
2: The estimated peak flows are based on Maryland Peak Flow Curve
3: The Safe and Maximum capacities will be determined in 2017.

Figure 4-F21: Rockville Service Area and Sewerage Systems



Projected flows based on forecasted population and other flow factors for the City of Rockville are summarized in Table 4-T16, including Rockville-WSSC agreed flow limitations and projected flows from the City of Rockville to the Watts Branch, Cabin John, and Rock Creek Basins for ultimate delivery to the Blue Plains WWTP.

Table 4-T16: Projected Wastewater Flows from the City of Rockville and WSSC-Rockville Flow Limitations.

YEAR		Cabin John Basin		Rock Creek Basin		Watts Branch Basin	
		Average (MGD)	Peak (MGD)	Average (MGD)	Peak (MGD)	Average (MGD)	Peak (MGD)
2015	Actual Flow	2.28	5.70	1.51	3.78	2.01	5.02
	WSSC-Rockville Flow Limitation	n/a	6.8*	n/a	9.84	n/a	8.0
	Balance	n/a	1.10	n/a	2.75	n/a	0.8
2030	Projected Flow	2.29	5.72	2.31	5.78	2.49	6.23
	WSSC-Rockville Flow Limitation	n/a	6.8*	n/a	9.84	n/a	8.0
	Balance	n/a	1.08	n/a	4.06	n/a	1.77
2040	Projected Flow	2.41	6.02	2.40	6.00	2.61	6.53
	WSSC-Rockville Flow Limitation	n/a	6.8*	n/a	9.84	n/a	8.0
	Balance	n/a	0.78	n/a	3.84	n/a	1.47

n/a: The agreements between the City and WSSC only specify peak sewage flow limitations for each sewer basin; the average flows limitation is for the City as a whole, not for each basin.
* The City's allowed peak flow downstream of Booze Creek is 8.0 MGD.
The actual 2015 average flow was provided by WSSC.
In 2017, 0.477 MGD of Average Wastewater Flow will be diverted from the Cabin John Basin to the Rock Creek Basin upon the completion of the City's East Rockville Sanitary Sewer Capacity Improvement project.
Peak flows are based on a historical peaking factor of 2.5 times the average wastewater flow.
2030 and 2040 projections are from Rockville's Water Resources Element (WRE)

Total projected Average Wastewater Flow for 2030 is 7.11 MGD and for 2040 is 7.42 MGD per the 2010 Water Resources Element of the City of Rockville's Comprehensive Master Plan.

A summary of planned Capital Improvement Program (CIP) projects that address wastewater conveyance constraints/ needs and improve service for Rockville's customers is provided in Appendix A of this Plan. The City of Rockville has two wastewater CIP projects in the adopted FY2017 Budget: Blue Plains Wastewater Treatment Plant and Sewer Rehabilitation and Improvements. The Blue Plains Wastewater Treatment Plant CIP project funds the City's share of the capital improvements within the DC-Water and WSSC conveyance systems and the City's share of capital improvements at the Blue Plains Wastewater Treatment Plant. The City does not control the projects within these systems and facilities, so therefore has no control over the spending.

The Sewer Rehabilitation and Improvements CIP project funds the rehabilitation, repair, and/or replacement of the City's sanitary sewer infrastructure. The City considers three factors when assessing the sanitary sewer infrastructure: the physical condition, the capacity to safely convey wastewater without surcharge or overflow, and the proximity to other City programmed work.

Rockville inspects its sanitary sewer infrastructure using comprehensive closed circuit television (CCTV) condition assessments performed in a preventive maintenance program. The CCTV assessment provides a visual assessment to rate the condition of the sewer using Pipeline Assessment Certification Program methodology. The highest scoring (poorest condition) sewer segments are prioritized for rehabilitation, repair or replacement depending on the need. Excessive maintenance issues identified by Operations and Maintenance staff (such as repeated sewer backups) are also considered.

Through flow monitoring and hydraulic modeling, the City assesses the capacity of the sewer system to determine its ability to safely convey wastewater flow. Sewer pipes that are at the highest risk for surcharging or overflow are prioritized for rehabilitation, repair, and/or replacement.

Sewer infrastructure close to stream restoration and stormwater management facility improvement projects are also prioritized to allow the sewer rehabilitation, repair, and/or replacement work to take advantage of construction access created for other programmed work within Environmentally Sensitive Areas.

Due to funding constraints, programmed projects in the Sewer Rehabilitation and Improvements CIP project have been deferred to FY2021. Appendix A identifies both the funded and unfunded costs needed for the City's wastewater system CIP program.

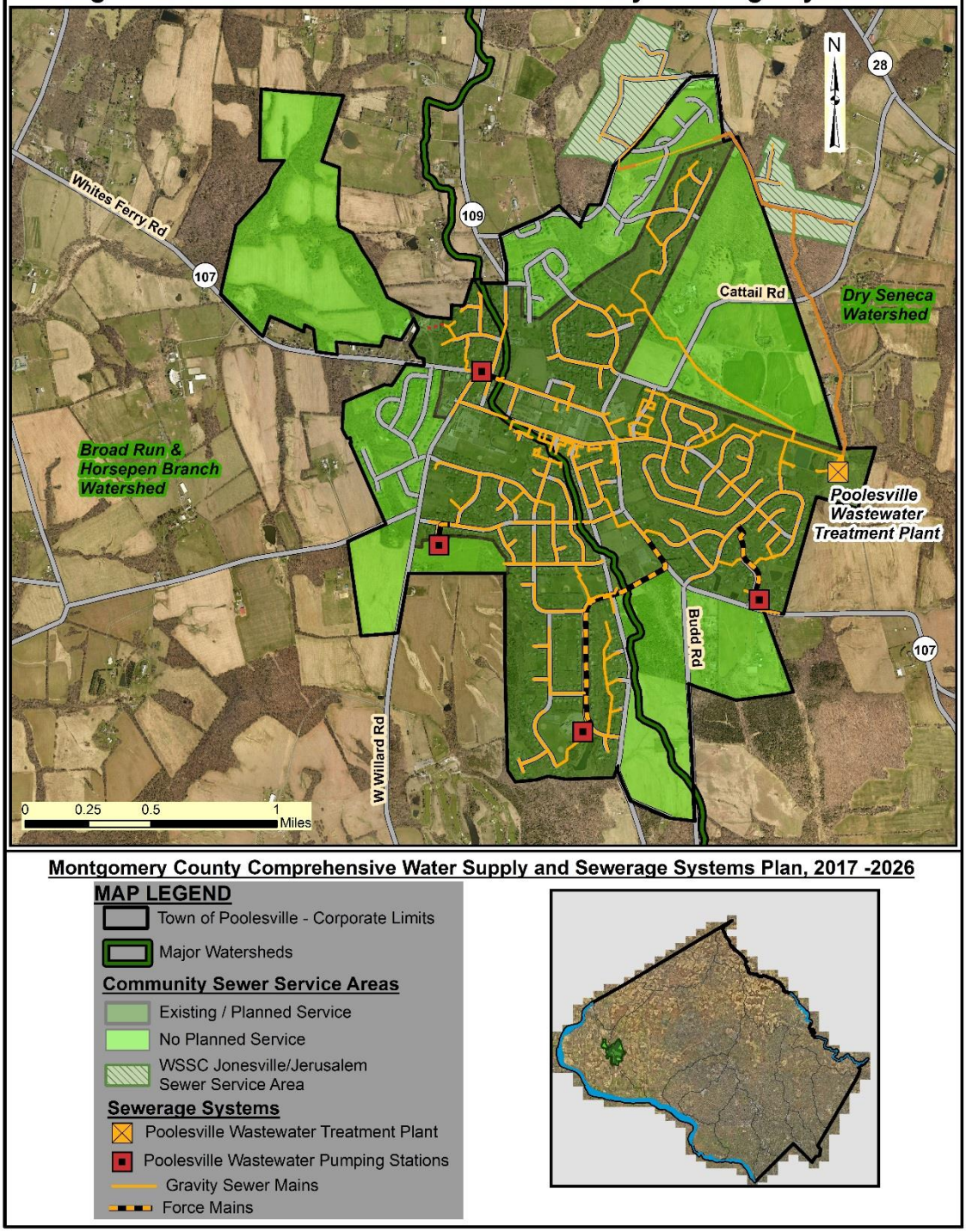
II.D. Treatment Facilities:

Rockville is located within the Blue Plains Service Area, and is served by the Blue Plains WWTP. The City does not own or operate any separate wastewater treatment facilities. The city's wastewater is ultimately delivered to the Blue Plains WWTP through WSSC's and DCWater's conveyance facilities. Rockville owns 9.31 MGD treatment capacity of WSSC's 169.9 MGD allocated treatment capacity. The use of these facilities is governed through several agreements, as described previously.

III. TOWN OF POOLESVILLE SERVICE AREA:

The Town of Poolesville operates its own sewerage system, which has been in operation since 1964, and is the only publicly owned sewerage system in Montgomery County with total self-sufficiency outside the Washington Suburban Sanitary District. The existing facility serves approximately 1,800 residences. The majority of the sewer service area is within the Dry Seneca Creek watershed.

Figure 4-F22: Town of Poolesville Community Sewerage Systems



III.A. Intergovernmental Agreements:

A 1984 agreement between WSSC and the Town of Poolesville allows WSSC to send up to 20,000 gpd from the Jonesville/Jerusalem area, located within in the WSSD, to the Poolesville WWTP. The Department of Environmental Protection's (DEP's) review of recent WSSC flow monitoring indicated that sewage flows from proposed development projects in the Jonesville/Jerusalem area, when added to existing and committed flows, will come close to exceeding this maximum flow allowance. Consequently, this Plan limits future community sewer service in the Jonesville/Jerusalem area as specified in Chapter 1.

III.B. Infiltration and Inflow (I&I) Control Program:

Since 2004, the Town has been aggressively eliminating Inflow and Infiltration (I&I) from the sewer collection system. The initial I&I elimination program consisted of several repairs in the sewer sections located in the oldest parts of Town and included a total relining of terracotta mains and public portion of the laterals located in the Wesmond Subdivision. This initial program took several years to complete and at a cost of over 2.2 million dollars.

Phase 2 of the I&I elimination program covered the total relining of "transite" mains and public portions of the laterals in the Westerly subdivision. This project is projected to cost over 2.4 million dollars and was complete in the Spring of 2015.

Phase 3, recently completed, consisted of installing "top hats" on laterals in mains that had been previously relined in the downtown commercial areas of Town.

Overall, the Town is experiencing a steady decrease in the rainfall to average sewer gallons per day treated over the past several years and expect to see a dramatic decrease in the averages with the completion of the final phases of the I&I elimination program.

WSSC owns and operates sewer lines from the Jonesville and Jerusalem areas that are scheduled for manhole relining within the next year.

III.C. Financing Sewerage Systems:

Information on the Town's sewerage system financing is included in Section IV.C of Chapter 1. Additional information on Capital Program for the Town of Poolesville is available at:

http://www.poolesvillemd.gov/296/Budget.

III.D. Collection and Conveyance Systems:

The Town's sewerage collection system consists of 90,000 linear feet of 6- to 18-inch diameter gravity sewers, 5,000 linear feet of 4- to 8-inch diameter force mains, and six permanent pumping stations ranging in capacity from 75 to 600 gallons per minute (see Figure 4-F22). Flows from two areas north of the town within the WSSD, Jonesville and Jerusalem, are also conveyed to the town's sewerage system. A combined low-pressure and gravity sewerage system in these areas conveys flows to an outfall sewer feeding into the Town's treatment plant. These mains are owned and maintained by WSSC.

Wastewater Pump Station	Average Dry Weather Flow (MGD)[1]	Estimated Peak Flow (MGD)[2]	Safe Capacity (MGD)[3]	Maximum Capacity (MGD)[3]
Stoney Springs	.02	.035	.0864	.108
Elgin Road	.0075	.07	.16128	.2016
Fisher Avenue	.04	.1	.2304	.288
Hunters Run	.11	.2	.6912	.864
Seneca Chase	.01	.14	.5419	.864
Oxley Farm	.0025	.075	.16128	.2016

1: The average dry weather flows are based on actual 2015 flow data.
2: The estimated peak flows are based on actual 2015 data.
3: The Safe and Maximum capacities are based on 80% and 100%, respective, of the run time of the pumps recorded during 2015.

III.E. Treatment Facilities:

The Town of Poolesville owns and operates a 750,000 gallon per day Wastewater Treatment Plant (WWTP). This sequence batch reactor type facility was upgraded in 2010 to a biologically enhanced nutrient removal (ENR) system. The facility processes also chemically precipitate and remove phosphorus through aluminum chlorohydrate addition. The unit processes employed at the WWTP includes:

- **Primary Treatment -** Grinder, chemical addition (phosphorus removal), rotary filter screen, compactor
- **Secondary Treatment -** Activated sludge process (including nitrification) and clarification occur within the same reactor
- **Advanced Treatment -** Dual media filtration - pressure vessels
- **Disinfection -** Ultraviolet Irradiation
- **Solids Conditioning -** Two stage aerobic digestion, chemical conditioners (polymer), belt filter press
- **Solids Disposal -** Land fill

III.F. Wastewater Capacity Management Plan:

The Town of Poolesville has developed a Wastewater Capacity Management Plan. The Plan utilizes a three-year rolling average of discharge flows from the WWTP to determine the available capacity for development allocation. By January 31 each year, the Town is required to develop and submit to the MDE a Municipal Sewage Capacity Report. The reports will include the three most recent years of flow data contained in the Discharge Monitoring Reports. To determine the annual average flow, the monthly average flow for each month will be averaged with the other monthly averages.

According to the MDE, use of an estimate of 250 gallons per day (gpd) per single-family dwelling or 100 gpd per person is a common practice. Considering this typical domestic usage, the Town's allocation of 325 gallons per day per household is calculated to include an allowance for I&I.

The following methodology will be used to manage wastewater capacity and to control the distribution of capacity to avoid burdens to the system and to maintain sufficient set aside to accommodate the system.

- Calculate the past three-year averages
- Add the number of allocated (not connected) sewer connections that the local government has provided a written commitment
- Subtract this sum from the permitted 750,000 gpd

The remaining balance is the **net available wastewater capacity** This capacity allocation will be based on 325 GPD/household.

IV. BIOSOLIDS MANAGEMENT:

Biosolids is a term adopted in recent years to refer to the municipal wastewater solids formerly referred to as sewage sludge. These solids are the residuals from the primary, secondary, and tertiary treatment processes at wastewater treatment plants. The residuals are usually thickened and dewatered into a "cake" that generally consists of about 20-30 percent solids. Both federal and state regulations define the stabilization or pathogen reduction techniques required to allow these solids to be recycled as biosolids. Biosolids are generally recycled as soil amendments or fertilizers by either direct land application or after being composted. Industrial pretreatment regulations ensure that metals and/or toxics are not significant components of biosolids. Both the EPA and MDE strongly support the beneficial reuse of biosolids, as opposed to disposal techniques such as incineration and land filling.

Biosolids are defined in State law as solid waste. The significance of this designation is that MDE requires the County to report on the planning and management of biosolids in the County's Solid Waste Management Plan. A restatement of the information reported in the Solid Waste Management Plan is contained here in the following sections is for the purpose of continuity, since biosolids are a product of wastewater treatment and must be managed as part of the wastewater treatment plant operations.

IV.A. Biosolids Production in Montgomery County:

As described in previous sections of this Chapter, about 80% of all the wastewater generated in Montgomery County is treated at the Blue Plains WWTP in the District of Columbia. The remaining 20% is treated at the treatment plants within Montgomery County and include the Seneca WWTP, Damascus WWTP, and Poolesville WWTP. An estimated total of 70 wet tons per day (wtpd) of biosolids are produced from the treatment of the wastewater at the three mentioned WWTPs in the County. A small amount of biosolids (less than 1 wtpd) generated at the Hyattstown wastewater treatment plant are transferred to the Damascus WWTP to be included in biosolids processing. The approximate biosolids production for each treatment plant is included in the following table.

APPROXIMATE DAILY BIOSOLIDS PRODUCTION (Montgomery County -2015)

Treatment Service Area	Daily Production (wtpd)
Seneca WWTP	60
Damascus WWTP	6
Poolesville	4

WSSC is responsible for the management of the biosolids generated from each of the treatment plant they operate within Montgomery County.

Proportional to its wastewater flow discharge to Blue Plains WWTP, an estimated 25-30% of the total biosolids that are generated at the Blue Plains Advanced Wastewater Treatment Plant is from Montgomery County. Based on the latest available data, the total biosolids production at the Blue Plains WWTP was reported to be 410 wet tons per day (wtpd) for September, 2015.

IV.B. Biosolids Disposal and Reuse:

Generally, most of the biosolids from the WSSC treatment plants in Montgomery County (Seneca, Damascus, and Hyattstown WWTPs), are reused through land application program on farmlands.

Biosolids that are land applied are subject to requirements of State-issued sewage sludge utilization permits and nutrient management plans. The locations of the permitted sites are determined by the contractor that manages this material. The bidding process requires that each bidder have the necessary permitted sites to manage the biosolids. Historically, these sites have been on the Maryland Eastern Shore, Frederick, Howard, and Prince George's, and Montgomery counties; or in Virginia. Active permitted land application sites for biosolids in Montgomery County are listed in Table 4-T17. The land application sites in Montgomery County receive biosolids generated from a number of wastewater treatment plants in the surrounding area including the Seneca and Damascus wastewater treatment plants.

Table 4-T17 - Active Permitted Land Application Sites of Biosolids in Montgomery County

Facility Number	Permit Number	Expiration Date	Property Location
64230	2008-SAG-5370	03/05/2014	Poolesville
36724	2010-SAG-5066	08/03/2016	Dickerson

Source: Maryland Department of the Environment - 2016

As part of a significant long-range program to improve the biosolids management practices at the Blue Plains WWTP, the DC Water is currently at the final stages of constructing major facilities to improve the way biosolids are processed at the Plant. The main focus of this long-range biosolids management program is on recycling an organic and nutrient-rich material in an environmentally safe and beneficial manner. All the biosolids generated at the Blue Plains WWTP are currently reused through a diverse recycling program including land application to improve the soil for agricultural production and many other projects. The stabilized biosolids are applied as fertilizer and mulch to farmlands.

Even though the DC Water is responsible for the Blue Plains Biosolids Management Program, other parties and stakeholders such as WSSC may be involved in planning and decision making process.

WSSC has recently completed a major facility planning study to explore and determine the best alternative in managing its future biosolids produced from all of its wastewater treatment plants within both Montgomery and Prince George's counties. The focus of this facility plan was to examine and develop a comprehensive program providing for the best alternative to process biosolids in a manner that is environmentally beneficial and is also economically feasible. The recommended and approved alternative included the design and construction of a central bio-energy project comprised of Thermal Hydrolysis, Mesophilic Anaerobic Digestion, and Combined Heat and Power facilities. The project is currently at the preliminary design stage and the expected completion date has been scheduled for the year 2021. When complete, some of the expected environmental and economic benefits would include:

- Significant reduction in biosolids quantity.
- Production of digester gas as renewable fuel which will be used to produce heat and electric power.
- Producing high quality (Class-A) biosolids which can be used more widely than the Class-B biosolids currently produced.

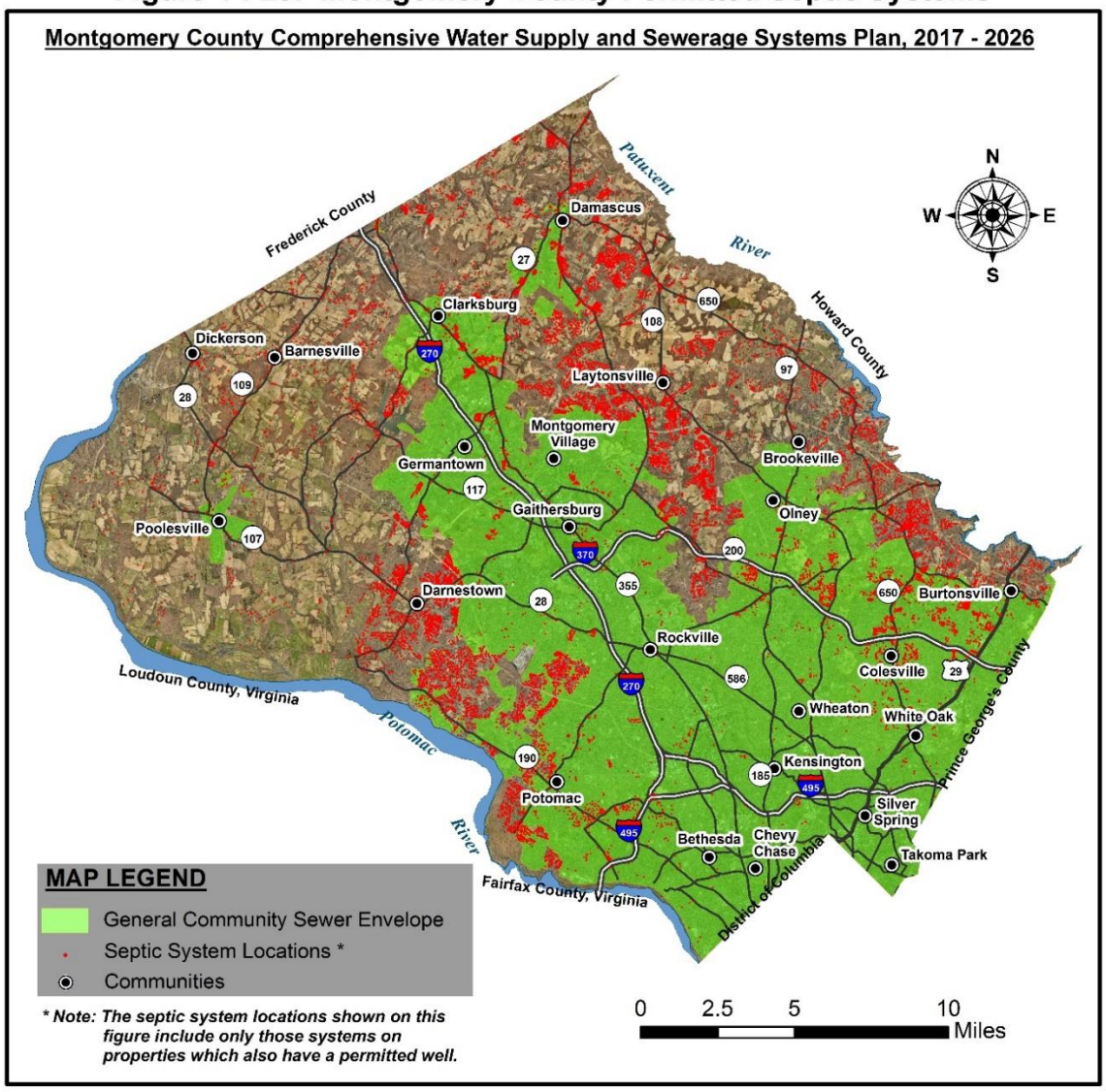
As part of their updated Biosolids Management Program (BMP), the DC-Water is currently at the final phases of constructing major facilities to upgrade its biosolids processing and management practices. The upgraded biosolids processing plant when complete will largely replace the current lime stabilization with thermal hydrolysis and anaerobic digestion. The completed facilities will include construction of four Cambi thermal hydrolysis trains, four anaerobic digesters, new dewatering equipment, and a combined heat and power plant. The upgraded biosolids facilities are scheduled to be operational in the near future. When placed in operation the upgraded treatment process would have the potential to reduce the quantity of biosolids by approximately 50%. Other benefits include generating digester gas to be used for heating and electrical power and producing a Class-A biosolids product.

V. INDIVIDUAL WASTEWATER DISPOSAL SYSTEMS AND RURAL SANITATION

In the more rural, less-densely populated parts of Montgomery County, residents, businesses and institutions depend primarily on individual septic systems for their wastewater disposal needs. Septic systems typically provide primary treatment in an underground septic tank, and then discharge the remaining effluent to the ground for biologic treatment.

The areas dependent on septic systems generally coincide with the County's well service areas, forming an irregular crescent starting in the southwestern part of the County, sweeping around to the west, then north towards Clarksburg and around Damascus, then south and east along the Patuxent River watershed (see Figure 4-F23). Most septic systems are located in areas not served by the community sewerage systems, the lower-density "wedges" referred to in the County's General Plan, "On Wedges and Corridors." However, older septic systems are found scattered throughout the County's community sewer systems service area, often where development occurred before community systems were available. Larger individual sewerage systems are referred to as "multiuse systems." For additional information on Individual Systems in the County please refer to Chapter 1, Section III.B. of this Plan.

Figure 4-F23: Montgomery County Permitted Septic Systems



V.A. Septic Systems Permitting:

The County's Department of Permitting Services (DPS), Well and Septic Section—under an authority delegated from the Maryland Department of the Environment (MDE)—is responsible for the administration and enforcement of County and State laws and regulations governing onsite, individual sewerage systems. Relevant State regulations are included in COMAR 26.03.01, 26.03.05, and 26.04.02 -.04. The County's regulations are included in County Executive Regulation 28-93AM,"On-Site Water Systems and On-Site Sewage Disposal Systems in Montgomery County."

DPS fulfills these responsibilities by reviewing preliminary plans and record plats for properties served by individual, on-site systems; by issuing permits for and inspecting the construction of new and replacement systems; and by responding to complaints concerning on-site systems. Testing a property for new septic systems involves two tests:

- The water table test to determine the probable highest level of water-saturated soil. The water table test can only be done the late winter through early spring when the water table is at its highest level. The duration of the water table testing season depends on overall precipitation conditions for the preceding year or years. Dry conditions, particularly prolonged droughts, can require DPS to shorten the duration of the water table testing season.
- The percolation test to determine the speed at which fluids percolate through the soil. The percolation test may be done at almost any time of the year. However, if a water table test is required for a site the percolation test must follow a successful water table test.

As part of these testing procedures, DPS also checks for shallow, fractured rock. Additional regulatory constraints may also affect finding a suitable location for a septic system on a property.

Under the County's current on-site system regulations, new construction (a new structure or a significant expansion of an existing structure) may use only trench or sand-mound septic systems that satisfy Executive Regulation 28-93AM. New lots are usually required to have sufficient area that satisfies testing standards for an initial drainfield and three reserve drainfield areas for later use. New lots using sand mound septic systems and existing lots installing replacement septic systems are required to have space for an initial drainfield and two reserve areas.

More background information on individual, on-site wastewater disposal systems is included in Chapter 1 of this plan.

V.B. Septic System Problems:

The following circumstances are among those that may constitute an existing public health problem resulting from a septic system failure:

- The presence of inadequately treated sewage rising to the surface of the ground or backing up into a building;
- A frequent need to pump out a septic system in order to keep overflows or backups from happening;
- Evidence of a sewerage system discharging inadequately treated sewage into ground or surface waters, drainfields constructed within the water table or on fractured bedrock, or an overflow pipe that allows the surface discharge of inadequately treated sewage;
- An existing building that can be served only by a sewage holding tank;
- A structure, previously served by an on-site system, that cannot be rebuilt because of a failure to locate a replacement on-site system that satisfies current permitting requirements.

In addition, the expectation that existing onsite septic systems cannot be replaced to support existing development once they fail, can present anticipated public health problems.

V.B.1. Aging and Replacement of Individual Sewerage Systems:

Individual systems regulations have changed over time resulting in changes to individual systems standards and technologies. Each regulatory change has provided for individual systems that are safer for both the human and natural environment.

Older individual sewerage systems may:

- Use several varieties of outdated underground discharge structures such as seepage lagoons, dry wells, and seepage pits.
- Have overflow pipes that prevented overloaded, failing systems from backing up sewage into buildings. Unfortunately, this allowed for sewage discharges onto the ground surface through the overflow pipe, some into drainages such as roadside stormwater swales.
- Have been installed on soils inappropriate for septic systems under today's testing standards because of conditions such as high water tables and shallow fractured rock.

The County may allow outdated wells and septic systems to serve existing structures provided they continue to function adequately. However, DPS has the option to require a replacement septic system that satisfies current regulations in cases where:

- An existing septic system suffers a failure or where such a failure is imminent.
- Overflow pipes need to be removed; which may result in an eventual failure of the septic system.
- Property improvements (expansion or replacement of an existing structure, new swimming pool, etc.) are proposed, including cases where original permit records are not available.
- Subdivision of an existing property served by individual, on-site systems will change property lines and affect allowed setbacks.

V.B.2. Septic System Problem Areas:

Septic system problems are not always limited to a single lot or parcel. Soil problems (slow percolation rates, shallow water table or bedrock, etc.) can affect a larger area and involve many properties. Where evidence shows existing or potential problems that affect several properties, those areas are designated and inventoried as public health problem areas in this Plan.

As existing housing stock and the individual, on-site systems they depend on age, the County faces a potential problem in sustaining not just specific homes and businesses, but entire neighborhoods that currently use these systems. Some of these neighborhoods, built in the boom years of the 1950s and 1960s, were created:

- On lots that are now too small to support both wells and septic systems under current regulations. A typical residential septic system needs at least 10,000 sq. ft. of land for initial and reserve field areas. Septic systems in the Patuxent River Watershed, with its water supply reservoirs, require 70 percent more reserve area than elsewhere in the County.
- On sanitary system technologies that no longer satisfy current regulations (seepage pits, sewage lagoons, overflow pipes, etc.).

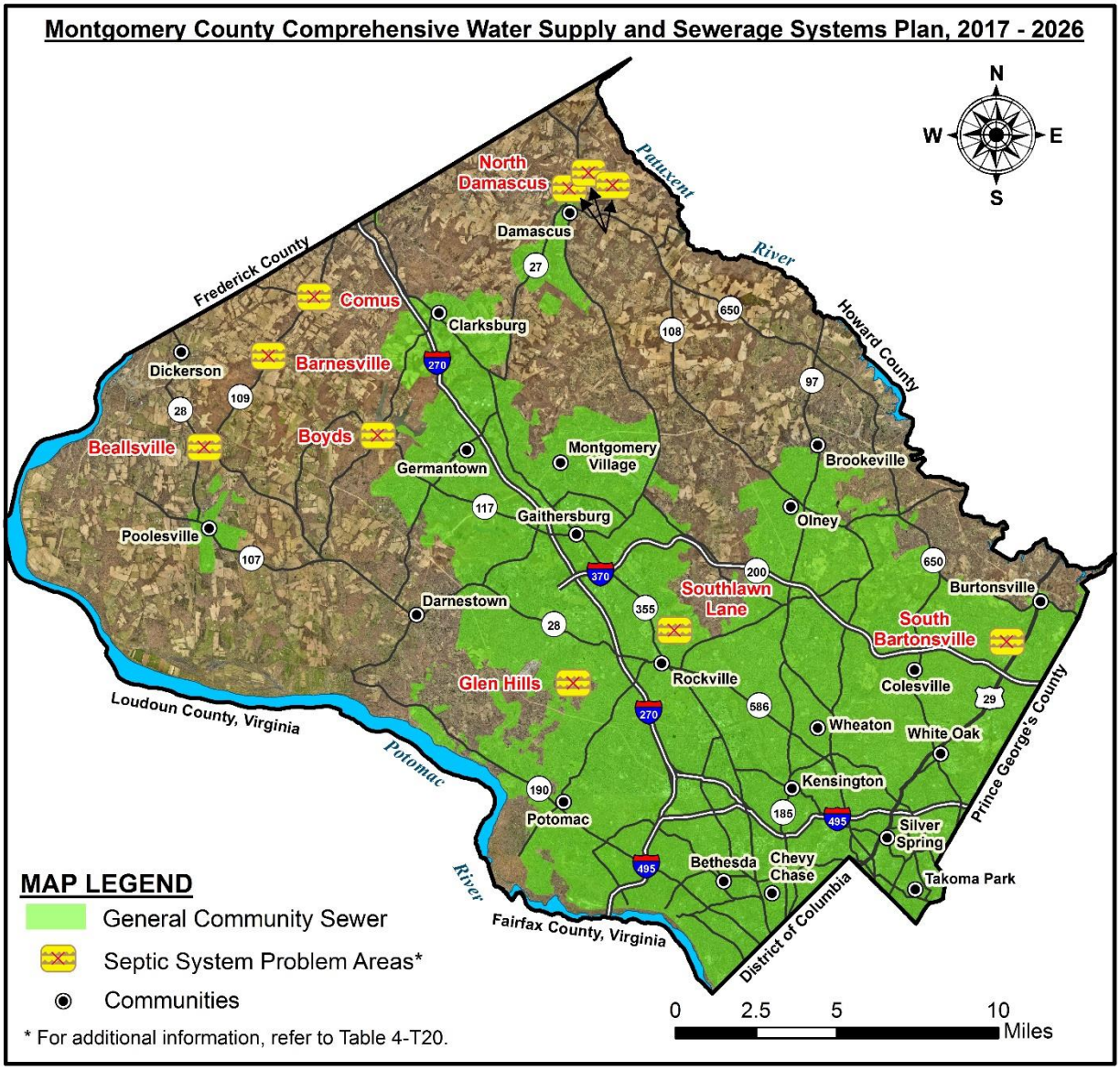
Although DPS does not currently maintain a comprehensive database of septic problems throughout the County, that agency has provided information concerning problem areas based on staff experience as identified on Figure 4-F24. The County's Septic Problem Areas with additional information are also listed in Table 4-T18.

Table 4-T18: Septic Problem Areas

Communities with Outstanding Septic System Problems

Location	Problem	Potential Solutions	Recommendations/Actions Taken
Town of Boyds	▪ failing septic systems, some on relatively small lots	DPS recommends: ▪ community sewer service	The provision of community sewer service will require further investigation by DEP and DPS. Sewer extension issues to this part of the County could have dramatic effects on development demand.
South Burtonsville: Miles Rd., Duvall Rd., Tolson Pl., and Maple Hill Rd.	failing septic systems	▪ community sewer service	DEP continues to approve sewer category change requests within this area. The development of a new residential subdivision along Miles Rd. has brought new sewer mains into the area, expanding the availability of public service.
Clarksburg Historic District	failed septic systems, poor soils unsuited for septic system use, relatively small property sizes	▪ community sewer service	DEP continues to coordinate sewer service extension proposals with WSSC, DPS and DGS. A proposal to utilize funding related to a new fire station in the area has been set aside for the time being pending decisions on the location for the facility. Service extensions and pumping facilities may need to be coordinated with community sewer service for new development in the Ten Mile Creek watershed.
Damascus: Gue Rd., Howard Chapel Dr., Ridge Rd. and adjacent areas	failing septic systems - unable to repair	DPS recommends: ▪ community sewer service	Properties in the vicinity of Ridge Rd. and Tune Ave. have been approved for community sewer service. Extension costs and community cooperation appear to be deterrents to implementing needed low-pressure systems to relieve these problems. The approval and extension of community to service to other, more distant neighborhoods (Gue Rd., Howard Chapel Dr.) pose greater challenges in terms of required sewer infrastructure. Sewer service for these areas could require specific septic system and sewer systems facility studies.
Glen Hills - southwest side of Rockville	failing septic systems, poor soils	▪ community sewer service ▪ innovative/alternative on-site systems	Based on a study of septic systems in the neighborhood conducted DEP, in March 2016 the County Council revised sewer service policies for this area to match policies applied to RE-1-zoned areas elsewhere in the County. The neighborhood had been subject to a more restrictive service policy resulting from the 2002 Potomac Subregion Master Plan.
Southlawn La. - Northeast side of Rockville	failing septic systems, poor soils	Rockville DPW and County DPS recommend community sewer service	Even though Rockville conducted a feasibility study to provide sewer service to the community in this area, it was never materialized. However, in 2013 Rockville constructed and put into service a water main to provide public water to the community.
Rural communities: • Barnesville • Beallsville • Comus (Slidell Rd.)	failing septic systems - unable to repair	DPS recommends: ▪ community sewer service ▪ innovative/alternative on-site systems	These communities are beyond the reach of the County's existing and proposed community sewerage systems.

Figure 4-F24: Montgomery County Septic System Problem Areas



V.B.3. Individual Systems Program Recommendations:

At present, the County has no programs in place to promote the long-term sustainability of individual onsite sanitary systems. The Plan should place an increased emphasis on addressing the needs of older communities that may find their future options limited using individual, on-site systems. Presently there are minimal opportunities for public education and no regular maintenance reminders, inspections, or testing. In Montgomery County, once a well or septic system is installed and operating, there will very likely be no further contact between the owner and the County regarding that system until it fails. A more proactive policy could delay or prevent failure of these essential water supply and waste treatment systems.

Improving the way in which the County addresses rural sanitation issues and public health problem cases resulting from the failure of wells and septic systems will require approaches from several fronts. The combined efforts of several agencies will be needed: DEP, DPS, M-NCPPC, WSSC, and MDE. While DPS maintains the responsibility for permitting and regulating individual systems in the County,

that agency is not charged with performing systematic, long-range planning to address rural sanitation systems. Other than the designation of areas intended for service from individual systems and evaluating public health areas (failures or problematic systems), recent versions of the Water and Sewer Plan have had little to say about rural sanitation planning. This Plan update is taking the first steps towards addressing that oversight.

Plan Recommendation: County to Develop Program Addressing the Potential Sanitation Problems from Aging Individual, On-Site Systems in the County's Neighborhoods

The County should create, budget, and implement appropriate programs to research, prioritize, and address the potential sanitation problems from aging individual, on-site systems facing the County's neighborhoods. This will be especially important for rural neighborhoods located outside the effective/efficient reach of community water and sewerage systems.

Solving the concerns about older neighborhoods using individual on-site systems may require new and innovative solutions beyond the usual provision of community water and/or sewer service. These may include, but are not limited to:

- Proactive, periodic on-site systems maintenance and inspection programs coordinated with public outreach and education on individual systems maintenance;
- Alternative community distribution, collection and treatment systems;
- Shared water and/or sewerage systems, owned by local communities and operated by authorized agencies or utilities (see Chapter 1, Section III.C.);
- Alternative financing for relief systems (community or otherwise), including but not limited to special assessment districts, grants or loans from government resources, or utility assistance programs;

Programs to assist lower-income individuals and communities in financing required relief systems.

As described in Chapter 1, multiuse sewerage supply systems are individual, on-site wastewater disposal systems with a capacity of 1,500 or more gallons per day. Because of their greater potential for environmental impacts, these systems require approval by the County Council in the Water and Sewer Plan. These facilities are generally large-capacity septic systems, although some facilities use more advanced treatment systems. DEP coordinates the Council's Plan approvals for these systems with DPS. Appendix B includes a listing of the multi-use sewerage facilities in Montgomery County approved in this Plan.

Most multiuse sewerage systems are standard septic systems with large design capacities. Other types of multiuse sewerage systems include:

- Spray irrigation systems – These systems often work well with a seasonal use such as a golf course. Any flows generated over the colder part of the year must be stored for later spray application during the growing season.
- Small wastewater treatment plants - A few facilities, such as the Mirant Generating Station in Dickerson and the Bretton Woods Country Club in western Potomac, operate what are essentially small wastewater treatment plants. (Because these facilities serve and are owned by an individual user, this Plan still classifies them as individual systems.)
- Surface water discharge systems - A few facilities also operate using a direct surface water discharge, rather than subsurface groundwater discharge. The Mirant generating facility and

the County's Resource Recovery Facility, also in Dickerson, release treated effluent to the Potomac River via a State issued discharge permit (NPDES). Other multiuse systems use low-pressure dosing systems, aerobic pre-treatment systems, etc.

All of these are characterized as multiuse systems, despite their differences in treatment methods, because of how they are owned and operated, by what type of facility they serve, and finally because of their size.

In 2006, the County Council adopted multiuse sewerage systems capacity limitations for properties located within the County's AR Zone, then the RDT zone. The limitations are intended to keep the size of non-residential development in the County's agricultural reserve area consistent with the generally smaller-scale uses typically associated with development presently allowed by zoning in the agricultural zone. Refer to Chapter 1, Section III for additional information.